

COMMENTS ON THE AMENDMENTS AND REMARKS

1. This is Applicant's Response to the Office's communication dated 2/3/03 (cover is Exhibit "A", attached). Applicant thanks Examiner Palabrica for the careful attention accorded to some sections of Applicant's previously submitted Response dated 12/3/02 (Certificate of Mailing was 12/3/02) .

2. The Examiner states,

"This amendment revised claims 1, 3, 4, 6, 12, 13 and 19, added new claims 21-22, and traversed the rejection of previously examined claims. "

The Examiner may not be accurate about the claims revised. The Claims in Applicant's response amended were claims 1,3,4,6,8,12,13.

3. Applicant acknowledges, but respectfully disputes, for the reasons discussed below, that Claims 1-10, 12-19, 21 and 22 are rejected under 35 U. S. C.102(b) as being anticipated by Westfall (US 5,215,631), Claims 1, 2, 4, 5, 7, 10, 13, 15, 16 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Kinsella et al.(US 3,682,806), Claims 1-8 and 13-16 are rejected under 35 U.S.C.102(b) as being anticipated by Patterson (US 5,318,675) or Patterson (US 5,372,688), and all Claims 1-10, 12-19, 21, and 22 are rejected under 35 U.S.C. 101 and 35 U.S.C. 112 by the Examiner, based upon his inadequate foundation (documented and discussed below) and his repeated flawed reference to other art ("FP" or "F+P").

4. Applicant acknowledges and thanks the Examiner, and corrects the claims which have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for reasons of specificity. [Applicant simply notes for the record that this Examiner, Mr. Rick Palabrica has previously suggested/ordered/recommended changes in other applications, he then refused to enter those very changes even when they involved no new material and were only in response to his comments.] X

5. Claims 1-10, 12-19, 21, and 22 remain in this application. Claim 5 has been amended to fully comply with the Examiner's comments regarding 35 USC 112, second paragraph. Now, based upon said Examiner's comments said claims of record have been rewritten and amended and now Claims 1-10, 12-19, 21, and 22 fully and completely distinguish the present invention over the cited references. The Amendment is only made in response to the comment of the Examiner, the wording and scope of the change maintains the wording and scope of the original disclosure. The Amendment contains no new matter, and was discussed explicitly in the original specification and claims. The

amendment is strictly composed of the language of the specifications and claims of the original disclosure. The wording and scope of the addition maintains the wording and scope of the original disclosure.

There are no additional cost or fees since there are now three independant claims and 20 total claims, and there is no change in claim number.

6. The Applicant notes that the Examiner's cited References were not provided. This is at least the second (2nd) time that Mr. Palabrica has withheld references from the Applicant in a patent application, thereby making response more difficult.

7. Applicant notes the Examiner cites scores of new references but there is no Form 1449. Applicant requests that one be provided now, and an explanation of its absence.

Applicant also notes that the Examiner did not include and return his checked-off Form 1449 of the Exhibits which Applicant supplied to rebut the Examiner. This is wrong at least two ways. First, it is improper because the Exhibits and Forms were provided two (2) times, as certified by the official stamp of the Office [Exhibit "B", attached]. Second, this happened in another case, too, and Applicant requests that both be addressed and the Forms supplied, along with the latest Forms 1449 submitted herein to rebut the new additional inaccurate statements and new material of the Examiner, thrown at the Applicant at FINAL.

8. Applicant notes the Examiner has not addressed several sections of Applicant's Response of 12/3/02 and many of the Examiner's previous questions have simply been re-asked which is unfair and is a harassment because the previous response (before FINAL) had Declarations and Exhibits which have not been substantively addressed.

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Applicant acknowledges that the Examiner has not addressed the previously-submitted Declarations, merely giving false explanations without foundation. This is especially wrong, in the light of the Examiner citing the parent application ['970] but failing thereafter to answer previous Orders of the Board to deal with said Declarations. This is improper because the Examiner hides behind '970 in his evasions (infra) but the law and standards of review require, and Applicant respectfully requests, that the Examiner abide by the still-ignored Orders today (attached, Exhibits "C", the first of which specifies explicitly said Declarations).

9. To rebut the Examiner's Communication, several Exhibits are now sent with this communication, including Exhibits, copies of peer-reviewed journals, and other art. These references are only necessary to rebut the inaccurate statements made by the Examiner [pursuant In re Grey, In re Oetiker], and are listed on the accompanying Forms PTO-1449. They were not submitted earlier because they are less relevant than the

previously cited references, and because they were not necessary before said inaccurate and disingenuous statements in said Communication. Applicant's requests the Examiner address this.

To rebut the Examiner's Communication, in addition, reference is made to several Declarations, including the Declaration of Dr. Mitchell Swartz [especially the Declaration from October 22, 02]. Dr. Swartz, is qualified as an expert with four degrees in electrical engineering from MIT, and an MD from Harvard. The other affiants have probative value, including Hal Fox ["Fox declaration"; BS physics and mathematics from the University of Utah in 1951, an M.B.A. from the University of Utah in 1972, and has published extensively in this scientific field; Editor of *Fusion Facts* (ISSN#1051-8738) and *Journal of New Energy* (ISSN#1086-8259)], Dr. Eugene F. Mallove, (hereinafter called the "Mallove Declaration"; ScD Harvard, BS MIT; former Senior Science Writer in the Press Office for the Massachusetts Institute of Technology (Cambridge, MA); Editor of the journal "*COLD FUSION*" (ISSN#1074-5610) and *Infinite Energy* (ISSN#1081-6372)], Ms. Gayle Verner, Dana Rotegard, Dr. Robert Bass, Drs. Melvin Miles, Brian Ahern and Dr. Raymond Kurzweil.

10. The invention at issue in this case, '765, is claimed by Claims 1-10, 12-19, 21, and 22, and is generally speaking a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal and means to extract product using magnetic field inhomogeneity, based on differential magnetic susceptibilities.

Each of these features, and those of the original specification of which this is the divisional has obvious great utility. Thus, the claims of this application ['765, Claims 1-10, 12-19, 21, and 22] are respectfully submitted to be patentable over the cited references because:

i) the claims recite novel structure and thus are distinguished physically over every reference [Sec. 102], and

ii) said physical distinction effects new and unexpected results, thereby indicating that said physical distinction is unobvious [Sec. 103].

11. Applicant acknowledges the past Notice of Patent Drawing Objection. New drawings will be filed after allowance.

ON PURPORTED NEW MATTER

12. The Examiner states,

"Applicant addressed this problem by deleting references to "fuel cells", replacing "hydrogen storage" with "hydrogen loading" and deleting "pressure" in the term 'pressure-loaded' metals in the statement of relevance of the claimed invention. This change would still not qualify the current application as a continuation of S/N 09/760,970 because there are still significant differences in the subject matters..."

THE TRUTH - Not New Material

The Examiner is incorrect for several reasons. First, the addition of hydrogen storage, hydrogen loading, pressure, and pressure loading are not new material. Instead, these matters were discussed at length in the original specification and claims of which the above-entitled invention is a continuation, and they were also discussed at length in the record of that patent application. They were also discussed in the submitted declarations (systematically substantively ignored to this point in time). The alleged new material was already discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, on page 13. Where is the Examiner's substantive response? The Examiner has ignored many of the Applicant's detailed Arguments about this.

13. The Examiner states,

"The parent application refers to "electrochemical nuclear fusion in or about metals" that is different from the broader subject matter of "electrochemical reactions in or about metals" in the current application."

THE TRUTH - Not New Material

The Examiner is incorrect for several reasons. First, electrochemical nuclear fusion is the same as electrochemical reactions in or about metals which were discussed in the original application and claims (' 970) and the above-entitled application (' 765). Second, these reactions are not new material since they were in both applications. Furthermore, the identical nature of the two descriptions is not new material, because it was an' 970. *WD*

The Examiner states,

"Also, the parent case specifically highlights the relevance of the claimed invention to "cold nuclear fusion in pressure loaded metals" whereas the current case deletes the "cold" term and refers only to "nuclear fusion in loaded metals." Accordingly, the current application cannot claim priority to the 9/17/91 filing date of the S/N 09/760,970."

THE TRUTH - Not New Material

The Examiner is incorrect for several reasons. First, cold nuclear fusion in loaded metals is the same as cold nuclear fusion in pressure loaded metals. The Examiner has given not a single reason for his misinterpretation of this matter and those above (super). Second, these are not new material by are from the original application and the specification and claims (' 970).

The Examiner states,

"Change from "applied magnetic field" to "applied spatially inhomogeneous magnetic field", shown as underlined in amended claim 2."

THE TRUTH - Not New Material

The Examiner's claim that "homogeneous" magnetic fields, "spatially homogeneous", "redistribution of isotopic fuel into said material", are new is absolutely false. First, these could hardly be new material because they were discussed in the patent application of which the present application is a continuation ('970), and the present application which discussed this. The concepts and words were used in the original application,

Second, proving this are the several Declarations which were submitted previously.

Third, there are orders (Exhibit "C") for the Examiner to address the declarations of Dr. Swartz and Strauss which discuss exactly this. How could it be new? And where is the response? Where is the evidence that the Examiner has ever addressed any of the declarations substantially? Therefore, the Applicant requests the Examiner reconsider this issue.

The Examiner states,

"The amendment is objected to under 35 U.S.C. 132 because introduces new matter into the disclosure.

The added material, which is not supported by the original disclosure, is as follows: Patent Applications 08/406,457 and 09/573,381 shown underlined under "U.S. Patent Documents" on page 96, "

"Applicant is required to cancel the new matter in the reply to this Office Action." "all references shown underlined under "Other Publications" on page 97, " "as well as all citations to these references in the revised specification."

THE TRUTH - Not New Material

The Examiner is unfair and disingenuous for several reasons. First, these changes were made only in response to his suggestion, and orders.

Second, none of this was new material and has been in previously submitted pending applications.

Third, although the applicant will be glad to remove these improper citations, but the Examiner appears not to have read the materials carefully, corroborated by his getting the claims wrong (above) and ignoring multiple arguments made by the Applicant in the previous Communication (below). Thus, it does seem unfair that the Examiner systematically requests/orders/suggested said changes and then attacks the applicant for making them.

Fourth, as the Applicant stated to the Examiner over the telephone in '695 (another divisional of '970) where the Examiner made a similar inaccurate statement, the Applicant respectfully disputes the purported *"addition of new matter"* and has asked the foundation

for the Examiner's statement. How can '381 be new material when it is a divisional of the same original specification and claims?

Fifth, the Applicant disputes the addition of new matter regarding '457 because '457 is a different patent application preceding the filing date of the present application, and the Applicant reminds the Examiner that the Court has stated that reference to other patents is allowable.

"An original specification can also incorporate by reference subject matter disclosed in another patent application which is pending before the Patent Office and hence unavailable to the public."

[In re JOLLES; United States Court of Customs and Patent Appeals, 1980, 628 F.2d, 1322, 206 USPQ 885]

In summary, therefore, the Applicant disputes the "addition of new matter" statement regarding reference material well-known to those skilled-in-the-art made after the Examiner requested/demanded/suggested it. The Examiner should address at least two facts: In re Jolles applies to other Applicants, and '381 is a Divisional from the same identical application ('970). Also, it is egregious that the Examiner asked for the background references. Finally, these are NOT new material. Applicant swore so by Declaration, as did other affiants who are educated and skilled-in-the-art. The Declarants stated facts, not opinion. The standards of review require the Examiner to explain precisely and substantively why he disagrees. Therefore, the Applicant requests the Examiner reconsider this matter. Applicant reserves the right of Petition, if necessary, given the changes were made after the demand/suggestions/orders of the Examiner.

INDEFINITESS - 35 USC §112 SECOND PARAGRAPH

14. The Office states,

"Claims 5 and 22 recite The limitation "the group". There is insufficient antecedent basis for this limitation in the claims.

Claim 21 recites in the preamble a method to effect redistribution of said isotope of hydrogen, whereas the body of the claim recites "thereby distributing said isotope of hydrogen within said loaded metal." It is unclear which of the recited steps produces the isotope redistribution."

The applicant thanks the Examiner very much for these comments. Claim 22 does not have "the group" in it. Claim 5 is now corrected pursuant to the Examiner's comment. Claim 21 is clear for the reasons discussed below in detail. The Examiner should allow entry since the Examiner suggested the changes.

PURPORTED INDEFINITESS - 35 USC §112 SECOND PARAGRAPH

15. The Office inaccurately states,

"Claims 1, 10 and 21 are vague, indefinite and incomplete as to what is actually the product. (Note this specific rejection that applied to previous claims 1-14 was not addressed in Applicant's response to the previous Office Action)"

The Examiner is disingenuous. Applicant respectfully notes that this was discussed in the previous Communication with the Examiner on pages 14 through 16 and also pages 91 through 95 where it was also discussed through the prism of those skilled-in-the-art. Furthermore, again below Applicant discusses this again (heat, nuclear products).

Notwithstanding the above, it is disingenuous for the Examiner to claim there is indefiniteness. "... **(I)ndefiniteness in claim language is of semantic origin**" [In re Hammack, 427 F.2d 1384 n.5, 166 USPQ 209 n.5 (CCPA 1970)] because indefiniteness is the opposite of definiteness. Definiteness is a characteristic of a patent claim in which claim language makes the scope of the claim clear to a person skilled in the art to which the invention pertains [MPEP 2173, MPEP 2173.02, MPEP 2173.05(a)]. Pursuant, to MPEP 2173, Applicant claimed with particularity, and did point out and distinctly claim the invention. Applicant's claims are therefore definite because the claims are precise, clear, correct, and unambiguous to a person skilled-in-the-art and, therefore, there was definiteness. The specification did conclude claims particularly pointing out and distinctly claiming the subject matter. Applicant has fully complied with the definiteness requirement of the second paragraph of 35 U.S.C. §112. The original specification and claim adequately presented the claimed invention so that an artisan, or those skilled in the art, could practice it without undue experimentation [In re Wands, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed.Cir.1988)].

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In this case, the products are obviously nuclear products and heat. Even the Examiner admitted such elsewhere in his communication. Even the affiants testified as such.

Definiteness Corroborated By Declarants

The Examiner has not responded to the fact that Definiteness is proven by way of Applicant's previously-submitted expert testimony [Ex parte Gray, 10 USPQ2d 1922, 1928 (Bd. Pat. App. & Inter. 1989)], including Declarations and Amicus Curiae Briefs. The Examiner purports that if an Affiant has actual knowledge of the invention, then said affiant is "not disinterested". This is absurd, illogical, unlawful, and not ethical. The simple proof of definiteness is that there has never been a problem for the previous Examiner of '970 in this regard, or more importantly with the Declarants who are skilled-in-the-art or even with the court [In re Swartz 00-1107 and In re Swartz 00-1108]. Therefore, this Examiner must accurately discuss the invention as it is actually taught in the original specification and claims. The claimed invention should be the focus of the definiteness requirement.

Definiteness Supported By The Claims

16. The Examiner has not responded to the fact that there is definiteness because the pending claims must be given the broadest reasonable interpretation consistent with the specification [In re Prater, 415 F.2d 1393, 162 USPQ 541 (CCPA 1969), also MPEP Section 2111 - Section 2111.01] and the specification stated the meaning of the terms in the claims [In re Zletz, 893 F.2d 319, 13 USPQ2d 1320 (Fed. Cir. 1989)]. Furthermore, there is definiteness because pursuant to 2173.05(a) the meaning of every term used in the claims was apparent from the prior art, cited art, and from the specification and drawings at the time the application was filed. There is definiteness because the claims must each be given the broadest reasonable interpretation consistent with that which one who is skilled-in-the-art would reach [In re Morris]. In this case, it is corroborated by both the Declarations, Amicus Briefs, and peer-reviewed publications.

Definiteness Supported By The Office Rules

The Examiner has not responded to the fact that there is definiteness consistent with Office Rules. The preamble of claim 1 recites the purpose of the process, and the process steps are able to stand alone (MPEP 2111.02). Pursuant to 2173.05(b), the fact that claim language may not have been precise cannot automatically render the claim indefinite under 35 U.S.C. 112, second paragraph [Seattle Box Co., v. Industrial Crating & Packing, Inc., 731 F.2d 818, 221 USPQ 568 (Fed. Cir. 1984)].

Additional Reason Overcoming The Examiner's Position - Definiteness Supported By Probative Reference

17. The Examiner has not responded to the fact that the peer-reviewed reference support definiteness [Swartz (1992), Swartz (1994A), Swartz (1994B), Swartz (1997A), Swartz (1997B), Swartz (1998A)] which prove understanding by one skilled in the art [Atmel Corp. v. Information Storage Devices Inc., Fed. Cir., No. 99-1082, 12/28/99].

Additional Reason Overcoming The Examiner's Position - Definiteness Proven By Other Rejections

Applicant notes to the Examiner that there had to have been definiteness because the Examiner could not have made the previous rejections under 35 U.S.C. 102 had the invention truly been without definiteness. Applicant reserves the right to Petition this matter, especially in the light of the un-rebutted ignored Declarations.

18. In summary, there IS definiteness because acceptability of the claim language depends on whether one of ordinary skill-in-the-art would understand what is claimed, and that is confirmed by the light of the specification, the Declarations, the Amicus Briefs, and the peer-reviewed publications [Ex parte Porter, 25 USPQ2d 1144, 1145 (Bd. Pat. App. & Inter. 1992)]. The Examiner has not responded to the fact that 35 U.S.C. 112, second paragraph requires the Examiner had to provide reasons why the terms in the claims and/or scope of the invention are unclear

"in a positive and constructive way, so that minor problems can be identified and easily corrected, and so that the major effort is expended on more substantive issues."

19. All definiteness issues are hereby addressed. If there are other issues with Claims 1-10, 12-19, 21, and 22, the Examiner is asked to identify with specificity and clear explanation what the rejection is based on [Ex parte Ionescu, 222 USPQ 537,539 (Bd. App. 1984)].

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The Claims Distinguish Over The References Under 35 U.S.C. §102

20. The Office states,

"Claims 1-10, 12-19, 21 and 22 are rejected under 35 U.S.C.102(b) as being anticipated by Westfall (US 5,215,631)."

Applicant respectfully notes that this was discussed in the previous Communication with the Examiner on pages 17 through 22 and page 39. The Applicant thanks the Examiner for his response to a few of the comments (and they are addressed below), but where is the Examiner's substantive response to the rest? Many of the corrections below are because the Examiner did not respond in detail, precisely to what the Applicant stated.

21. The Office states,

"(The Applicant previously said) 'The application was filed prior to Westfall.' Westfall's patent has a priority date of April 25, 1990 that is more than one year prior to the 12/28/00 filing date for the current application."

THE TRUTH - The Application is a Continuation of a 1991 Application

Westfall was issued June 1, 1993 and was filed October 11, 1991. Westfall is a "continuation in part of serial number 514,192 which was abandoned, and certainly as different from the present application as Westfall. Ignoring for the moment that Westfall's invention is very different from the invention described by the present application, the examiner should know that the present application is a continuation calls a filing made 9/17/91.

22. The Office states,

"(The Applicant previously said) 'Westfall does not have the purpose, advanced technology, features and advantages of the claimed invention.'

These are immaterial because file claims define the invention and the claims are the ones examined for patentability. The examiner has shown that Westfall's process and apparatus read on file applicant's claims."

THE TRUTH - Two Obviously Different Inventions

This statement by the examiner is minimizes the scope of the differences between Westfall and the present invention. In the present invention, Figure 7 of the original specification, absolutely shows features which are not found in Westphal. For example, attention is directed to the four concentric components of the device surrounding the cathode, in coaxial fashion, including the deuteron diffusion barrier (labeled 50) and the expansion barrier (labeled 40). Where are they in Westphal? Attention is directed to the heavy water-LiOD-gel, labeled 6. Where is it in Westphal? Attention is directed to the device in Figure 7 shaped like a fuse, which "can be easily placed into, or removed from, an assembly and system". Where is it in Westphal?

In the present invention, Figure 8 shows features which are not found in Westphal. For example, attention is directed to the centrally placed axially-filled cathode, the coaxial deuteron-barrier, the coaxial coaxial expansion-barrier. Where are they in Westphal? Attention is directed to the structural support system (labeled 20), the expansion barrier

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(labeled 40), and the deuteron impermeable barrier (labeled 50). Where are they in Westphal?

In the present invention, Figure 9 shows features which are not found in Westphal. Attention is directed to the cluster of seven CAM devices, with their external structural casing support system and intercluster thermomechanical material. Where are they in Westphal?

In the present invention, Figure 10 shows features which are not found in Westphal. Attention is directed to the central axially-filled cathode, the two coaxial deuteron-barriers inner thermal pipe, and the structural support system labeled 20. Attention is also directed to the inner thermal barrier labeled 70, the outer deuteron barrier labeled 50, and the barrier to expansion is labeled 20. Exactly where are any of these in Westphal? In the present invention, Figure 10 shows four layers (from inner to outer) which in the preferred embodiment are made of diamond filament, gold, palladium, and gold. Where are they in Westphal?

In the present invention, Figure 11 shows features which are not found in Westphal. For example, attention is directed to the coaxially-filled cathode, the inner coaxial deuteron-barrier and thermal pipe in a cylindrical configuration, the electric fields in the radial direction, and the anode which is circumferential to the cathode [labeled 7]. Where are they in Westphal? Figure 11 shows solution (labeled 6) which consists of lithium deuteroxide, palladium deuteroxide, and heavy water as the preferred embodiment. Where is it in Westphal?

In the present invention, Figure 12 shows features which are not found in Westphal. attention is directed to the three CAM devices (labeled as 90), the intradevice gel containing lithium and palladium deuteroxide (labeled 6), the device receptor apparatus (labeled 93 in figure 12), the electrical and thermal connectors (labeled 96, and 97 respectively), the mechanical connecting system (labeled 94), the heat dissipative radiator (labeled 95), and the three cathodic connectors are connected to the control apparatus. Where is it in Westphal? Figure 12 shows CAM devices which are inserted, similar to a fuse onto a holding board (labeled 91) held in place by clips (labeled 92). Exactly where are any of these in Westphal?

In the present invention, Figure 13 shows features which are not found in Westphal. For example, attention is directed to the lamellar CAM reactor, the two orthogonal applied electric fields, the connections for the first electric field labeled as 81 and 82, the connections for the second electric field labeled as 85 and 86, the mechanical casing labeled 20, and the deuteron impermeable barrier which is comb-shaped in this preferred configuration, and is labeled 55 in Figure 13. Exactly where are any of these in Westphal?

In the present invention, Figure 14 shows features which are not found in Westphal. For example, attention is directed to the three lamellar CAM reactors labeled as 90 in figure 14, and the intradevice gel containing lithium and palladium deuteroxide (labeled 6), and anode (labeled 7) held in place by clips (labeled 102), the electrical bus to connect

the anodes (labeled 105) which are connected to the anodic connectors (labeled 82), and the electrical bus which connects the cathodes (labeled 106 and 107). Where are these in Westphal? Attention is also directed to the thermal bus (labeled 107) connected to the heat pipes (labeled 70) which are held in a mechanical connecting system (labeled 20), the deuteron-impermeable barriers (labeled 55 in figure 14), the heat pipes (70) and the thermal bus (107). Are any of these in Westphal?

In the present invention, Figure 15 shows features which are not found in Westphal. For example, attention is directed to the mechanical casing labeled 20, the deuteron impermeable barrier labeled 55, and the external structures labeled 110 and 120, circumferential to the casing (20) which are used to squeeze the CAM reactor. Where are they in Westphal?

In the present invention, Figure 16 shows features which are not found in Westphal. Attention is directed to the three pressure-activated CAM reactors, the heat pipes (labeled 70), the expansion barrier (40), the deuteron diffusion barrier (labeled 50), the external casing (20), the thermomechanical connector (labeled 130), the external thermal bus (140), holding board (150, 151 above and below the assembly), and the external structures labeled 110 and 120 near-circumferential. Where are they in Westphal?

In the present invention, Figure 17 shows features which are not found in Westphal. For example, attention is directed to the transistor-like header (labeled as 200). Where is this in Westphal? Attention is directed to the perforated by six (6) holes accommodate insulators (labeled 210), the six electric leads (182, 185, 181, and 186), and two thermal connections (labeled 170 in figure 17). Where are they in Westphal?

In the present invention, Figure 18 shows features which are not found in Westphal. For example, attention is directed to the extraction of isotopic nuclear fusion product (e.g. tritium) by an axially loaded cathode (labeled 1; anode is labeled 7) using an inhomogenous magnetic field intensity applied by coil labeled 300 to one portion of the cathode (1). Where is any of this in Westphal?

23. The Office states,

"(The Applicant previously said) 'Westfall's electrode keeps moving unlike the claimed invention.'

This is immaterial The feature cited by the Applicant is non-limiting because if is not recited in file claims."

THE TRUTH - - Different Inventions - Even The surface of Westfall's Electrode changes Position

This statement by the examiner is false. This is corroborated by the Office's own statement that Westfall discloses,

"... a process and an apparatus for growing crystals by electrodeposition."

This is further corroborated because in 631, the crystals grow to become freestanding single crystals of tin in its cubic and tetragonal forms. 631 uses said grown crystals to make photovoltaic cells, as discussed in column 13, lines 55 through 66.

Examiner claims not figs

The cited US 5,215,631 does not even discuss loading. It instead discloses said electrode growing (unlike the present invention) at 4.2 feet per hour (column 36 lines 17 through 22). Westfall --as it claims-- is simply a process and an apparatus for growing crystals in linear growth rate (column 36 lines 17 through 22), useful for freestanding single crystals of tin in its cubic and tetragonal forms.

Westfall's crystals, grown at 4.2 feet per hour, do not have the purpose, advanced technology, features, and advantages of the present invention. By contrast, the present invention is not a process and an apparatus for growing crystals by electrodeposition, but in the preferred embodiment, a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal and means to extract product using magnetic field inhomogeneity, based differential magnetic susceptibilities, features of great utility. This is clearly shown in the Figures, and discussed, in the original specification of 765.

Thus, the present invention is novel and not anticipated by the cited art, Westfall.

24. The Office states,

"(The Applicant previously said) 'Materials and elements used by Westfall would not function if used in the claimed. Conversely, the materials and elements used in the invention would not function in Westfall's invention.'

The rejection was based not on file swapping of materials and elements, but whether the claimed method steps and apparatus elements are identical to or could be read into the prior art, which is the case for Westfall.

THE TRUTH - The Environments, Methods, and Elements Are Radically Different

This statement by the examiner is false. If the materials and elements used in Westfall, as suggested by the examiner, were to be used in the present invention, they would not function. Westfall --as it claims-- is simply a process and an apparatus for growing crystals in linear growth rate (column 36 lines 17 through 22), useful for freestanding single crystals of tin in its cubic and tetragonal forms. Furthermore, if the present invention was used as discussed in Westfall, the materials of '765 would not even be functional. Temperatures required for Westfall are such that, "crucibles must be chosen which are able to survive the corrosive nature of the molten salt baths" (column 32 lines 55 through 59). If the present invention, '765, was used as described in Westfall, it would not even work. The Examiner should address this.

25. The Office states,

e. (The Applicant previously said) 'Wesfall loads hydrogen outside the metal instead of inside the metal.'

Westfall discloses palladium as working electrode and his electrolyte is an aqueous solution that inherently contains hydrogen. Palladium is known to absorb deuterium, i.e., be loaded inside the metal. Applicant himself admits this as a well-known scientific fact by his claims.

THE TRUTH - The Examiner is Incorrect about Location and Loading

This statement by the examiner is false for several reasons, each of which proves that the material of Applicant's invention, '765, does not read on Westfall's process as the Examiner suggests.

First, when hydrogen appears in Westfall it is not for loading. It is to the air as gas (column 9, line 35 through 43, especially lines 39 referring to "bubbling"). This is different from that used in the present invention which is loaded as taught in the present invention's original specification and claims, and will be explained in detail below. This "bubbling" of hydrogen in Westfall is different from this application which involves loading an isotopic fuel to said material, loading said isotopic fuel into said material by an applied electric field, and then at a later point in time applying a second applied electric field to redistribute said isotopic fuel within said material, means to control the distribution of the loaded isotopic fuel within the material, means including barriers impermeable to the flow of said isotopic fuel within said material, as discussed in the present invention's original specification and claims.

This is corroborated because there is no mention of internal flows in the metal in Westfall. Furthermore, in Westfall all applied fields are synchronous, whereas in '765 they are metachronous (at different points in time).

Second, unlike the present invention, Westfall does not discuss loading which would be negligible at best. Furthermore there is no mention of internal flows within any part of Westfall. Corroborating this, in the present invention, the hydrogen sought is that within the palladium, which is not even discussed in Westfall.

The Examner syhould discuss this which was previously addressed on pages 17-22, 39, and 57-71.

To wit, the present invention uses hydrogen INSIDE a metal such as palladium for purposeful reasons, which are clearly different from the ions making large crystals quickly OUTSIDE the metal, such as described in Westfall. Attention is directed to the fact that in Westfall, unlike the present invention, there are enlarging metal crystals, ribbon crystalline growth systems, tin in its cubic and tetragonal forms, and crucibles using molten salt baths. Westfall's invention, a process and an apparatus for growing crystals of tin in its cubic and tetragonal forms controls ions OUTSIDE of the enlarging metal crystals (figures 2a through 2d, therein). Westfall refers to saturation OUTSIDE of the metal crystal and is an entirely different teaching from the present invention. Westfall

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does not even discuss loading into the material (underlined in Examiner's quote for emphasis). Furthermore there is no mention of internal flows within any part of Westfall. Thus, it cannot read on the present invention, a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal and means to extract product using magnetic field inhomogeneity, based differential magnetic susceptibilities.

Corroborating this, Westfall admits that the apparatus of Westfall is no more than a means to a process and an apparatus for growing crystals by electrodeposition with rapid metal growth rates at 4.2 feet per hour (column 36 lines 17 through 22). Westfall admits it makes photovoltaic cells (column 13, lines 55 through 66). Westfall also admits that crucibles must be chosen which are able to survive corrosive molten salt baths (column 32 lines 55 through 59).

Thus, the present invention is novel and not anticipated by the cited art, Westfall. Nowhere in Westfall, or in any combination of the Examiner's art, is any aspect of the features of '765. Thus, it cannot read on the present invention, a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal.

26. The Office states,

"(The Applicant previously said) "It is nonsense to consider Westfall's crystal growth being product removed through the growing metal crystal as the same as heat produced in the present invention."

This is precisely the point raised by the examiner on page 19 of the previous Office Action that rejected file claims because they are incomplete in failing to recite additional critical method steps and/or structure.

THE TRUTH - Products are as Different as the Inventions and Locations

This statement by the examiner is false. Heat and loading are as different as heat and charge or heat and the number of oranges in a basket. They are different. Furthermore, even the locations involved are different. US 5,215,631 discloses a process and an apparatus for growing crystals by electrodeposition which 1) involves ions other than hydrogen, 2) and they are on the OUTSIDE of the metal. Unlike the present invention, Westfall does not discuss loading. Furthermore there is no mention of internal flows within any part of Westfall.

Westfall's invention, a process and an apparatus for growing crystals of tin in its cubic and tetragonal forms controls ions OUTSIDE of the enlarging metal crystals (figures 2a through 2d, therein). Westfall refers to saturation OUTSIDE of the metal crystal and is an entirely different teaching from the present invention. 631 does not even discuss loading into the material (underlined in Examiner's quote for emphasis). Furthermore there is no mention of internal flows within any part of 631. Corroborating

this, Westfall admits that the apparatus of Westfall is no more than a means to a process and an apparatus for growing crystals by electrodeposition with rapid metal growth rates at 4.2 feet per hour (column 36 lines 17 through 22). Westfall admits it makes photovoltaic cells (column 13, lines 55 through 66). Westfall also admits that crucibles must be chosen which are able to survive corrosive molten salt baths (column 32 lines 55 through 59).

By contrast, the original specification and claims of the present invention, '765, claim a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal and means to extract product using magnetic field inhomogeneity, based differential magnetic susceptibilities.

Therefore, the material of Applicant's invention, '765, does not read on Westfall's process and an apparatus for growing crystals by electrodeposition, as the Examiner suggests. The apparatus described in Westfall has none of the properties of the apparatus described in the present invention. This demonstrates they are different patents entirely with different uses, reasons, and methods.

27. The Office states,

Westfall anticipates the applicant's method and claims but he does not claim production of excess heat. Therefore, there must be a critical feature of file claimed invention that is missing in file disclosure.

THE TRUTH - Multiple Critical Features are Present in this Invention

This statement by the examiner does not address that the present invention has many novel features which are simply not present in Westphal. For example, the Examiner should consider the following, without demeaning any of the other features of the present invention.

In the present invention, Figure 10 shows features which are not found in Westphal. Attention is directed to the inner thermal barrier labeled 70, the outer deuteron barrier labeled 50, and the barrier to expansion is labeled 20. Exactly where are any of these in Westphal?

In the present invention, Figure 11 shows features which are not found in Westphal. For example, attention is directed to the coaxially-filled cathode, and thermal pipe in a cylindrical configuration, and the anode which is circumferential to the cathode [labeled 7]. Where are they in Westphal?

In the present invention, Figure 12 shows features which are not found in Westphal. Attention is directed to the three CAM devices (labeled as 90), the mechanical connecting system (labeled 94), and the heat dissipative radiator (labeled 95). Exactly where are any of these in Westphal?

In the present invention, Figure 14 shows features which are not found in Westphal. For example, attention is directed to the thermal bus (labeled 107) connected to the heat pipes (labeled 70) which are held in a mechanical connecting system (labeled 20), the heat pipes (70) and the thermal bus (107). Are any of these in Westphal?

In the present invention, Figure 16 shows features which are not found in Westphal. Attention is directed to the heat pipes (labeled 70), the thermomechanical connector (labeled 130), and the external thermal bus (140) and holding board (150, 151 above and below the assembly. Where are they in Westphal?

In the present invention, Figure 17 shows features which are not found in Westphal. For example, attention is directed to the transistor-like header (labeled as 200), especially the two thermal connections (labeled 170 in figure 17). Where are they in Westphal?

Attention is also directed to the fact that the following elements shown in Westfall are not present, or needed, or claimed in the present invention. Said unneeded elements numbered in Westfall as bath (4, column 8, line 5), reference electrode (14), light source (18), stepping motor (22) and its mechanical connection to the cathode (8) are not needed in the present invention, as described in the original specification and claims, thereby proving the present invention has significant novelty and non-obviousness -- and is simply a different invention.

28. The Office states that Westfall is the same as the present patent even though Westfall discloses,

... the electrolytic apparatus ... comprising a bath (4) between a working electrode (where the crystal growth occurs) and a counter electrode (which replenishes the electrolytic solution's concentration of ions of the to-be-deposited material. The bath is used by passing current between the working and counter electrodes"

THE TRUTH - Different Purposes. Westfall makes growing crystals at 4.2 feet per hour

US 5,215,631 discloses a process and an apparatus for growing large crystals by electrodeposition. Westfall, as discussed therein, grows enlarging metal crystals as shown in figures 2a through 2d, therein. Westfall's invention is to produce dendritic crystals and explicitly involves ribbon crystal and crystalline growth systems with growth rates (deposition rates) of 4.2 feet per hour in linear growth rate (column 36 lines 17 through 22). Westfall's crystals, grown at 4.2 feet per hour, do not have the purpose, advanced technology, features, and advantages of the present invention.

Unlike Westfall, '765 teaches a two-stage method to control loading which solves the long-standing problem of controlling hydrogen flow in metals and extracting product using magnetic field inhomogeneity based differential magnetic susceptibilities - features of great utility. This is clearly shown in the Figures, and discussed, in the original

specification of '765. The present invention, '765, claims a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal and means to extract product using magnetic field inhomogeneity, based differential magnetic susceptibilities, as taught in the above-entitled patent application.

29. The Office states that Westfall reads on,

"Note also that since the Westfall's process and apparatus read on applicant's process and apparatus claims, the same can be said regarding applicant's claim language of "creating a catastrophic diffusion flux of said isotopic fuel in said material."

THE TRUTH -Catastrophic Flow differs from Electrochemical Throwing power

The material of Applicant's invention, '765, does not read on Westfall as the Examiner suggests. Westfall's enlarging metal crystals (figures 2a through 2d, therein) in ribbon crystal and crystalline growth systems have claims and teachings which are not the same as a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal and means to extract product using magnetic field inhomogeneity, based differential magnetic susceptibilities, as taught in the above-entitled patent application.

30. The Office states that ,

"Westfall further discloses the use of orthogonal electric fields as part of the nucleation manipulation techniques for crystal growth control. .. The orthogonal electric field reads on "means for producing a change in the quantity of said isotopic fuel."

THE TRUTH - Different Current Locations, Purposes, Time courses

Westfall does not disclose orthogonal electric fields as taught in the present invention's original specification. The present invention uses them within the electrode as the specification and claims prove. Thus the material of Applicant's invention, '765, does not read on Westfall's process and apparatus for growing crystals by electrodeposition, as the Examiner suggests. This invention is a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal and means to extract product using magnetic field inhomogeneity, based differential magnetic susceptibilities. Two stage process here after loading. Not in Westfall. Furthermore, in Westfall, all applied electric field intensities are synchronous in time, whereas in '765 they are applied metachronously (at different points in time).

— Error By Examiner Regarding Contamination —

31. The Office inaccurately states,

"Note further that West fall's aqueous solution contains ordinary water, which, in turn, has 0.01 6% heavy water content (see Etherington, Nuclear Engineering Handbook, p 8-27). This reads on the claim language regarding having deuterium in the isotopic fuel. Wesfall inherently also has a means to remove the product, i.e., formed crystal. Again, applicant's claim language reacts on such."

THE TRUTH - Contamination Quantity Is Insufficient

With all due respect, this is inaccurate because any putative cationic contaminant which the Examiner proposes, but for which there is no plan, will electrodeposit. Furthermore, as discussed with the Examiner previously, because of the divergence principle (no net creation of the putative contaminant so therefore the divergence = 0). The Examiner should read the books which the Applicant suggested previously regarding this because they are well-known to those familiar with the state-of-the-art. The applied electric field is direct to move cations (i.e. Pd^{++}) to the cathode where it plates out. The Examiner is referred to the following on electrochemistry and continuum electrodynamics, *sine qua non* to those skilled in the art [Uhlig, H.H., "Corrosion and Corrosion Control", Wiley (1971), Bockris, J., K.N. Reddy, "Modern Electrochemistry", Plenum Press (1970), Von Hippel, A. "Dielectric Materials and Applications", MIT Press, (1954); Von Hippel, A., D.B. Knoll, W.B. Westphal, "Transfer Of Protons Through 'Pure' Ice Ih Single Crystals", J. Chem. Phys., 54, 134, (also 145), (1971), and Melcher, J.R., "Continuum Electromechanics", MIT Press, Cambridge, (1981). Therefore the Examiners statement is incorrect after the application of the only electric field intensity in Pons, and the first electric field intensity in the present application.

In summary, the subject matter of Applicant's invention, '765, does not read on the Examiner's cited art which are not the same as a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal and means to extract product using magnetic field inhomogeneity, based differential magnetic susceptibilities, as taught in the above-entitled patent application.

32. Claims 1, 2, 4, 5, 7, 10, 13, 15 and 16 have been rejected under 35 U.S.C. 102 (b) as being anticipated by Kinsella (U.S. 3,682, 806). As discussed below, the Applicant demonstrates that said rejection is an error. This was discussed in the previous Communication with the Examiner on pages 33 through 37 and page 39. The Applicant thanks the Examiner for his response to a few of the comments (and they are addressed below), but where is the Examiner's substantive response to the rest? Where is the Examiner's response to the Applicant's other arguments? Instead, the Examiner once

again, has inadvertently or unintentionally just unfairly asked the same question. As a result, many of the corrections below are made again because the Examiner is disingenuous and has failed to reply in detail, precisely and substantively to what the Applicant previously stated. Therefore, notwithstanding the above, as discussed below, the Applicant demonstrates that said rejection is an error. Applicant's scientific criticisms are serious, and the Examiner is requested to please address the Applicant's comments.

Kinsella --as it claims-- is simply a process for electroplating metallic articles with carboxylic film-forming materials in a process utilizing lithium hydroxide as solubilizer (see Fig. 1 and column 8, 2nd paragraph). Kinsella demonstrates the most rudimentary of an electroplating process and it does not have the purpose, advanced technology, features, and advantages of the present invention. Kinsella, uses a stainless steel cathode, and only a one stage process. Kinsella uses no loading, or has no features of the present application. Corroborating this, from Kinsella, the Examiner quotes that 'Fig. 1 shows the anode (4), which is the material to be coated, a stainless steel cathode (6)'. Furthermore, as additional further proof in Kinsella the text explicitly states, as the Examiner quotes 'An alternative embodiment can have an auxiliary platinum anode (7) and an auxiliary stainless steel cathode (8)'. Kinsella leads away from the present invention as it uses a cationic membrane to divide the cathodic compartment (number 1 in Kinsella, column 9 line 65), a regenerated ion exchange resin (column 10 line 14), a auxiliary platinum anode ("7", column 10 line 15), a selective electrodialysis membrane to contain ion exchange resin ("9" and "12", column 10 lines 19-23), and a solubilized feed makeup material introduced to the anode ("11", column 10 line 11), which are not needed in the present invention, as described in the original specification and claims.

Thus, the present invention, unlike Kinsella which uses methods well known to those who work in the art, is not an electroplating process of carboxylic film-forming materials, but in the preferred embodiment is a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal. The present invention uses a two-stage process, loading of hydrogen, a metal electrode such as palladium, a first stage of electrode loading, and a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal, for purposeful reasons, which are clearly different from the carboxylic film-forming processes described in Kinsella.

33. The Office states,

"(The Applicant previously said) 'Kinsella recites features that are not-needed in the claimed invention. Kinsella does not have the purpose, advanced technology, features and advantages of the claimed invention.

These are immaterial because the claims define the invention and the claims are the ones examined for patentability. The examiner has shown that Kinsella's process

and apparatus read on the applicant's claims, and therefore, Kinsella anticipates the applicant's claims.

THE TRUTH -Different Inventions, Different Claims

The Examiner is incorrect and disingenuous. Kinsella is nothing like the present invention.

This statement by the examiner is minimizes the scope of the differences between Kinsella and the present invention. In the present invention, Figure 7 of the original specification, absolutely shows features which are not found in Kinsella. For example, attention is directed to the four concentric components of the device surrounding the cathode, in coaxial fashion, including the deuteron diffusion barrier (labeled 50) and the expansion barrier (labeled 40). Where are they in Kinsella? Attention is directed to the heavy water-LiOD-gel, labeled 6. Where is it in Kinsella? Attention is directed to the device in Figure 7 shaped like a fuse, which "can be easily placed into, or removed from, an assembly and system". Where is it in Kinsella?

In the present invention, Figure 8 shows features which are not found in Kinsella. For example, attention is directed to the centrally placed axially-filled cathode, the coaxial deuteron-barrier, the coaxial coaxial expansion-barrier. Where are they in Kinsella? Attention is directed to the structural support system (labeled 20), the expansion barrier (labeled 40), and the deuteron impermeable barrier (labeled 50). Where are they in Kinsella?

In the present invention, Figure 9 shows features which are not found in Kinsella. Attention is directed to the cluster of seven CAM devices, with their external structural casing support system and intercluster thermomechanical material. Where are they in Kinsella?

In the present invention, Figure 10 shows features which are not found in Kinsella. Attention is directed to the central axially-filled cathode, the two coaxial deuteron-barriers inner thermal pipe, and the structural support system labeled 20. Attention is also directed to the inner thermal barrier labeled 70, the outer deuteron barrier labeled 50, and the barrier to expansion is labeled 20. Exactly where are any of these in Kinsella? In the present invention, Figure 10 shows four layers (from inner to outer) which in the preferred embodiment are made of diamond filament, gold, palladium, and gold. Where are they in Kinsella?

In the present invention, Figure 11 shows features which are not found in Kinsella. For example, attention is directed to the coaxially-filled cathode, the inner coaxial deuteron-barrier and thermal pipe in a cylindrical configuration, the electric fields in the radial direction, and the anode which is circumferential to the cathode [labeled 7]. Where are they in Kinsella? Figure 11 shows solution (labeled 6) which consists of lithium deuteroxide, palladium deuteroxide, and heavy water as the preferred embodiment. Where is it in Kinsella?

*Figs. and
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In the present invention, Figure 12 shows features which are not found in Kinsella. Attention is directed to the three CAM devices (labeled as 90), the intradevice gel containing lithium and palladium deuteroxide (labeled 6), the device receptor apparatus (labeled 93 in figure 12), the electrical and thermal connectors (labeled 96, and 97 respectively), the mechanical connecting system (labeled 94), the heat dissipative radiator (labeled 95), and the three cathodic connectors are connected to the control apparatus. Where is it in Kinsella? Figure 12 shows CAM devices which are inserted, similar to a fuse onto a holding board (labeled 91) held in place by clips (labeled 92). Exactly where are any of these in Kinsella?

In the present invention, Figure 13 shows features which are not found in Kinsella. For example, attention is directed to the lamellar CAM reactor, the two orthogonal applied electric fields, the connections for the first electric field labeled as 81 and 82, the connections for the second electric field labeled as 85 and 86, the mechanical casing labeled 20, and the deuteron impermeable barrier which is comb-shaped in this preferred configuration, and is labeled 55 in Figure 13. Exactly where are any of these in Kinsella?

In the present invention, Figure 14 shows features which are not found in Kinsella. For example, attention is directed to the three lamellar CAM reactors labeled as 90 in figure 14, and the intradevice gel containing lithium and palladium deuteroxide (labeled 6), and anode (labeled 7) held in place by clips (labeled 102), the electrical bus to connect the anodes (labeled 105) which are connected to the anodic connectors (labeled 82), and the electrical bus which connects the cathodes (labeled 106 and 107). Where are these in Kinsella? Attention is also directed to the thermal bus (labeled 107) connected to the heat pipes (labeled 70) which are held in a mechanical connecting system (labeled 20), the deuteron-impermeable barriers (labeled 55 in figure 14), the heat pipes (70) and the thermal bus (107). Are any of these in Kinsella?

In the present invention, Figure 15 shows features which are not found in Kinsella. For example, attention is directed to the mechanical casing labeled 20, the deuteron impermeable barrier labeled 55, and the external structures labeled 110 and 120, circumferential to the casing (20) which are used to squeeze the CAM reactor. Where are they in Kinsella?

In the present invention, Figure 16 shows features which are not found in Kinsella. Attention is directed to the three pressure-activated CAM reactors, the heat pipes (labeled 70), the expansion barrier (40), the deuteron diffusion barrier (labeled 50), the external casing (20), the thermomechanical connector (labeled 130), the external thermal bus (140), holding board (150, 151 above and below the assembly), and the external structures labeled 110 and 120 near-circumferential. Where are they in Kinsella?

In the present invention, Figure 17 shows features which are not found in Kinsella. For example, attention is directed to the transistor-like header (labeled as 200). Where is this in Kinsella? Attention is directed to the perforated by six (6) holes accommodate

insulators (labeled 210), the six electric leads (182, 185, 181, and 186), and two thermal connections (labeled 170 in figure 17). Where are they in Kinsella?

In the present invention, Figure 18 shows features which are not found in Kinsella. For example, attention is directed to the extraction of isotopic nuclear fusion product (e.g. tritium) by an axially loaded cathode (labeled 1; anode is labeled 7) using an inhomogenous magnetic field intensity applied by coil labeled 300 to one portion of the cathode (1). Where is any of this in Kinsella?

NOTA BENE: The materials described in Kinsella do not have the properties of the materials described in the present invention.

The methods described in Kinsella are not the methods described in the present invention.

Corroborating this, attention is directed to the fact that the following elements shown in Kinsella are not present, or needed, or claimed in the present invention. Said unneeded elements numbered in Kinsella as 1 (cationic membrane to divide the cathodic compartment (column 9 line 65), 7 (a auxiliary platinum anode (column 10 line 15), 9 (a selective electrodialysis membrane to contain ion exchange resin (column 10 lines 19-23), and 11 (a solubilized feed makeup material introduced to the anode (column 10 line 11) are not needed in the present invention, as the described in the original specification and claims, thereby proving the present invention has significant novelty and non-obviousness.

The present invention is novel and not anticipated by Kinsella. Nowhere in Kinsella is any aspect of the features of '765. The materials described in Kinsella do not have the properties of the materials described in the present invention. The methods described in Kinsella are not the methods described in the present invention. Furthermore, if the materials and elements used in Kinsella, here the cationic membrane to divide the cathodic compartment (number 1 in Kinsella, column 9 line 65), a regenerated ion exchange resin (column 10 line 14), a auxiliary platinum anode ("7", column 10 line 15), a selective electrodialysis membrane to contain ion exchange resin ("9" and "12", column 10 lines 19-23), and a solubilized feed makeup material introduced to the anode ("11", column 10 line 11), as suggested by the examiner, were to be used in the present invention, they would not function. Similarly, if the present invention, '765, was used as described in Kinsella, it would not be functional.

34. The Office states,

"(The Applicant previously said) 'Kinsella loads outside the metal instead of inside the metal. in the claimed invention Kinsella discloses a material containing Zr and/or Ta, which can be loaded from the inside. Applicant himself admits this as a well-known scientific fact by his claims."

THE TRUTH Loading is Different from Crystal Growth

The Office is disingenuous again. First, Applicant has said much about contamination issues to which the Examiner near-endlessly inaccurately points.

Second, even the currents are handled differently. The patent teaches the loading current is into the volume of the cathode in contrast to the cited patent. In Kinsella, the loading current is onto the surface of the cathode in contrast to the cited patent which loads the volume for different purpose. Kinsella electroplates metallic articles with carboxylic films (column 8, 2nd paragraph). Unlike the present invention where there is a specialized palladium (or other hydrogen loading) cathode, in Kinsella, there is only a stainless steel cathode. Corroborating this, from Kinsella, the Examiner quotes that 'Fig. 1 shows the anode (4), which is the material to be coated, a stainless steel cathode (6)'. Furthermore, as additional further proof in Kinsella the text explicitly states, as the Examiner quotes 'An alternative embodiment can have an auxiliary platinum anode (7) and an auxiliary stainless steel cathode (8)'.

Third, further corroborating this, attention is directed to the fact that Kinsella leads away from the present invention as it uses a cationic membrane to divide the cathodic compartment (number 1 in Kinsella, column 9 line 65), a regenerated ion exchange resin (column 10 line 14), a auxiliary platinum anode ("7", column 10 line 15), a selective electrodialysis membrane to contain ion exchange resin ("9" and "12", column 10 lines 19-23), and a solubilized feed makeup material introduced to the anode ("11", column 10 line 11) which are not needed in the present invention, as the described in the original specification and claims. This proves that the present invention has significant novelty and non-obviousness. Fourth, attention is again directed to the fact that in Kinsella, unlike the present invention where there is a specialized palladium (or other hydrogen loading) cathode, in Kinsella, there is only a stainless steel cathode, only a one stage process, no loading, and no features of the present application.

35. The Office states,

"(The Applicant previously said) 'Kinsella uses a stainless steel cathode, uses no loading and does not have a two-stage process. .. Stainless steel can have a composition that contains Zr - (Group IVb metal) and/or Ta (Group Vb metal) both of which are suitable loading" materials as per claims 2 and 15. The second applied electric provides the second stage of the process."

THE TRUTH -Contamination Quantities are Insufficient

The Examiner is incorrect for many reasons. First, contamination quantities are never available in sufficient quantities is the examiner purports. Second, metal diffusion

rates from inside metals are well-known are not sufficient to produce quantities of materials as the examiner unscientifically alleges.

Furthermore, the examiner is not truthful. Kinsella is not a two-stage process. '765 teaches and claims a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal.

By contrast, Kinsella's process is for the purpose of electroplating metallic articles with carboxylic films.

36. The Office states that Kinsella reads on,

"Note that applicant's 'isotopic fuel' in the claim language reads on Kinsella et OH's lithium anions that form on the anode, 'material' reads on 'anode', 'loading of isotopic fuel into material' reads on the 'electrodeposition current' and its effect 'change in the active quantity of isotopic fuel within material' reads on the 'regeneration current' and its effect"

THE TRUTH - Electrodeposition Current Is Not The Loading Current

The material of Applicant's invention, '765, does not read on Kinsella's electroplating process using carboxylic film-forming materials, as the Examiner suggests. Kinsella's invention is an electroplating process carboxylic film-forming materials which cannot be the same as a two-stage process involving loading of hydrogen into palladium. Kinsella --as it claims-- processes carboxylic film-forming materials with lithium hydroxide as solubilizer (see Fig. 1 and column 8, 2nd paragraph). This cannot read on the hydrogen of the present patent because the applicant uses hydrogen as the loaded material. In addition, the 'anode' of Kinsella cannot be the 'material' because in the present patent, it is cathodically controlled and used for a different purpose.

The 'electrodeposition current' cannot read on 'loading of isotopic fuel into material' because in Kinsella, unlike the present invention where there is a specialized palladium (or other hydrogen loading) cathode, there is only a stainless steel cathode (6). Furthermore, Kinsella uses a cationic membrane to divide the cathodic compartment (number 1 in Kinsella, column 9 line 65), a regenerated ion exchange resin (column 10 line 14), a auxiliary platinum anode ("7", column 10 line 15), a selective electrodialysis membrane to contain ion exchange resin ("9" and "12", column 10 lines 19-23), and a solubilized feed makeup material introduced to the anode ("11", column 10 line 11) which are not needed in the present invention, or used therein for the purposes which Kinsella states. This proves that the present invention has significant novelty and non-obviousness.

Kinsella's invention which is an electroplating process carboxylic film-forming materials is not the same as a two-stage process involving loading of hydrogen into

palladium discussed in the present invention's original specification and claims. '765 reads on a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal.

37. The Office states,

"Claims 1-8 and 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Patterson (US 5,318,675) or Patterson (US 5,372,688)."

THE TRUTH - The Present Application is a Continuation of an Application filed in 1991

As discusses below, the Applicant demonstrates that said rejection remains a salient error. Applicant respectfully notes that this was discussed in the previous Communication with the Examiner on pages 23 through 28 and page 39. The Applicant thanks the Examiner for his response to a few of the comments (and they are addressed below), but where is the Examiner's substantive response to the rest? Where is the Examiner's response to the Applicant's other arguments? Instead, the Examiner once again, has inadvertently or unintentionally asked the same question. As a result, many of the corrections below are made again because the Examiner has failed to reply in detail, precisely and substantively to what the Applicant previously stated. [Notwithstanding the above, as discussed below, the Applicant demonstrates that said rejection is an error. Applicant's scientific criticisms are serious, and the Examiner is requested to please address the Applicant's comments.]

38. The Office states,

"(The Applicant previously said) 'The application was filed prior to Patterson ('675) and Patterson ('688) Patterson ('675) has a priority date of June 7, 1994 and Patterson ... Both were filed more than one year prior to the 12/28/00 filing date for the current application."

THE TRUTH - The Present Application is a Continuation of an Application filed in 1991

This statement by the examiner is false.

The applicant notes that the application '970 -of which the present invention '765 is a continuation of- was filed September 17, 1991, prior to Patterson-1,2. In addition it precedes the filing date of Patterson-1,2. Nonetheless *in arguendo*, the applicant will now discuss Patterson-1,2 in full detail to demonstrate that even if they were timely, they are not relevant to the present novel invention which is not anticipated by the cited art, Patterson-1,2. Nowhere in Patterson-1,2, or in any combination of the Examiner's art, are any aspect of the features of '765.

39. The Office states,

"(The Applicant previously said) "Patterson is not the same as the claimed invention. The examiner has shown how Patterson's process and apparatus read on the applicant's claims, and therefore, the Patterson patents anticipate file applicant's claims."

THE TRUTH - These are Different Patents with Different Features and Parts

This statement by the examiner is false. This statement by the examiner is minimizes the scope of the differences between Patterson and the present invention. In the present invention, Figure 7 of the original specification, absolutely shows features which are not found in Patterson. For example, attention is directed to the four concentric components of the device surrounding the cathode, in coaxial fashion, including the deuteron diffusion barrier (labeled 50) and the expansion barrier (labeled 40). Where are they in Patterson? Attention is directed to the heavy water-LiOD-gel, labeled 6. Where is it in Patterson? Attention is directed to the device in Figure 7 shaped like a fuse, which "can be easily placed into, or removed from, an assembly and system". Where is it in Patterson?

In the present invention, Figure 8 shows features which are not found in Patterson. For example, attention is directed to the centrally placed axially-filled cathode, the coaxial deuteron-barrier, the coaxial coaxial expansion-barrier. Where are they in Patterson? Attention is directed to the structural support system (labeled 20), the expansion barrier (labeled 40), and the deuteron impermeable barrier (labeled 50). Where are they in Patterson?

In the present invention, Figure 9 shows features which are not found in Patterson. Attention is directed to the cluster of seven CAM devices, with their external structural casing support system and intercluster thermomechanical material. Where are they in Patterson?

In the present invention, Figure 10 shows features which are not found in Patterson. Attention is directed to the central axially-filled cathode, the two coaxial deuteron-barriers inner thermal pipe, and the structural support system labeled 20. Attention is also directed to the inner thermal barrier labeled 70, the outer deuteron barrier labeled 50, and the barrier to expansion is labeled 20. Exactly where are any of these in Patterson? In the present invention, Figure 10 shows four layers (from inner to outer) which in the preferred embodiment are made of diamond filament, gold, palladium, and gold. Where are they in Patterson?

In the present invention, Figure 11 shows features which are not found in Patterson. For example, attention is directed to the coaxially-filled cathode, the inner coaxial deuteron-barrier and thermal pipe in a cylindrical configuration, the electric fields in the radial direction, and the anode which is circumferential to the cathode [labeled 7]. Where are they in Patterson? Figure 11 shows solution (labeled 6) which consists of lithium deuteroxide, palladium deuteroxide, and heavy water as the preferred embodiment. Where is it in Patterson?

In the present invention, Figure 12 shows features which are not found in Patterson. attention is directed to the three CAM devices (labeled as 90), the intradevice gel containing lithium and palladium deuterioxide (labeled 6), the device receptor apparatus (labeled 93 in figure 12), the electrical and thermal connectors (labeled 96, and 97 respectively), the mechanical connecting system (labeled 94), the heat dissipative radiator (labeled 95), and the three cathodic connectors are connected to the control apparatus. Where is it in Patterson? Figure 12 shows CAM devices which are inserted, similar to a fuse onto a holding board (labeled 91) held in place by clips (labeled 92). Exactly where are any of these in Patterson?

In the present invention, Figure 13 shows features which are not found in Patterson. For example, attention is directed to the lamellar CAM reactor, the two orthogonal applied electric fields, the connections for the first electric field labeled as 81 and 82, the connections for the second electric field labeled as 85 and 86, the mechanical casing labeled 20, and the deuteron impermeable barrier which is comb-shaped in this preferred configuration, and is labeled 55 in Figure 13. Exactly where are any of these in Patterson?

In the present invention, Figure 14 shows features which are not found in Patterson. For example, attention is directed to the three lamellar CAM reactors labeled as 90 in figure 14, and the intradevice gel containing lithium and palladium deuterioxide (labeled 6), and anode (labeled 7) held in place by clips (labeled 102), the electrical bus to connect the anodes (labeled 105) which are connected to the anodic connectors (labeled 82), and the electrical bus which connects the cathodes (labeled 106 and 107). Where are these in Patterson? Attention is also directed to the thermal bus (labeled 107) connected to the heat pipes (labeled 70) which are held in a mechanical connecting system (labeled 20), the deuteron-impermeable barriers (labeled 55 in figure 14), the heat pipes (70) and the thermal bus (107). Are any of these in Patterson?

In the present invention, Figure 15 shows features which are not found in Patterson. For example, attention is directed to the mechanical casing labeled 20, the deuteron impermeable barrier labeled 55, and the external structures labeled 110 and 120, circumferential to the casing (20) which are used to squeeze the CAM reactor. Where are they in Patterson?

In the present invention, Figure 16 shows features which are not found in Patterson. Attention is directed to the three pressure-activated CAM reactors, the heat pipes (labeled 70), the expansion barrier (40), the deuteron diffusion barrier (labeled 50), the external casing (20), the thermomechanical connector (labeled 130), the external thermal bus (140), holding board (150, 151 above and below the assembly), and the external structures labeled 110 and 120 near-circumferential. Where are they in Patterson?

In the present invention, Figure 17 shows features which are not found in Patterson. For example, attention is directed to the transistor-like header (labeled as 200). Where is this in Patterson? Attention is directed to the perforated by six (6) holes accommodate

insulators (labeled 210), the six electric leads (182, 185, 181, and 186), and two thermal connections (labeled 170 in figure 17). Where are they in Patterson?

In the present invention, Figure 18 shows features which are not found in Patterson. For example, attention is directed to the extraction of isotopic nuclear fusion product (e.g. tritium) by an axially loaded cathode (labeled 1; anode is labeled 7) using an inhomogenous magnetic field intensity applied by coil labeled 300 to one portion of the cathode (1). Where is any of this in Patterson?

The Examiner should also address the fact that Patterson uses a pump (18 in Patterson; column 3 line 11), reservoir (32; column 3 line 12), slide valve (22; column 3 line 24), second slide valve (30; column 3 line 25), test reservoir (34; column 3 line 26), inlet and outlet stoppers (54 and 56; column 3 lines 39-40), conductive palladium coated microsphere (36; column 3 line 54, and column 4 lines 41 through 60), a "conductive (sic) foraminous grid" (38; column 3 line 56) which do not even exist in the present invention.

40. The Office states,

"(The Applicant previously said) 'The claimed invention minimizes electrolysis unlike Patterson, the claimed invention methodically controls temperature unlike Patterson, and there are some reduction in accuracies in the experimental results from Patterson's inventions. The features cited by the Applicant are non-limiting because they not recited in the claims.

THE TRUTH -Patterson Does Not Involve A Catastrophic Diffusion Flux

This statement by the examiner is false for many reasons. Applicant also respectfully notes that this was discussed in the previous Communication with the Examiner on pages 23 through 28 and page 39. Where is the Examiner's response to the arguments?

First, actually, the issue of minimizing electrolysis is in the claims of the another of Applicant's inventions to which he does refer ['976]. Second, Patterson strives for "electrolysis" as the titles, description and claims of Patterson 1, and 2 admit. However, it is NOT desired in the present invention which is operated through control of the optimal operating points (infra).

Third, the present invention does claim a change in loading after intial loading. Patterson does not have a change in the loading after loading because the Office would have cited it. In fact, the Office admits to a precharging phase,

"Patterson refers to .. a "loading stage" during which a relatively low level current (0.05 amps) is introduced across the electrodes 15 and 16. During the initial loading, palladium surface of the microspheres (36) Any absorbs and combines with the hydrogen isotope, i.e., it becomes loaded. This loading takes about two hours under a current flow through the cell of about 0.05 amps (e.g., see column 6, lines 6+)."

Fourth, the features of the present invention ARE recited in the claims. Patterson's invention which is a simple electrolytic cell consisting of beads is not the same as a two-stage process of the present invention's original specification and claims. '765 reads on a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal. The material of Applicant's invention, '765, does not read on Patterson's a simple electrolytic cell consisting of beads, as the Examiner inaccurately states.

41. The Office states that Patterson reads on,

"Following the loading stage, the current level between electrodes 15 and 16 is then incrementally increased. During this time, the temperature of the electrolyte is both monitored and controlled by increasing the flow rate of electrolyte (59) therethrough (see column 6, lines 1+)."

"Note that the palladium-coated microspheres are immersed in the electrolyte and any change in the electrolyte temperature inherently changes the temperature of the material."

THE TRUTH - Controlling temperature of the electrolyte is NOT the same as this invention

The material of Applicant's invention, '765, does not read on Patterson's a simple electrolytic cell consisting of beads, as the Examiner falsely suggests.

First, controlling temperature of the electrolyte for flawed flow calorimetry is NOT the same as methodically controlling device temperature. Patterson's invention uses a flow calorimetric system. Patterson uses his pump (18 in Patterson; column 3 line 11), reservoir (32; column 3 line 12), slide valve (22; column 3 line 24), second slide valve (30; column 3 line 25), test reservoir (34; column 3 line 26), inlet and outlet stoppers (54 and 56; column 3 line 39-40) to effect temperature for different purpose, and by different process than the present invention.

Second, in Patterson, there is temperature control through the flow rate of electrolyte through rudimentary beads. Corroborating this, Patterson admits that the temperature of the electrolyte is both monitored and controlled by increasing the flow rate of electrolyte (59) therethrough (see column 6, lines 1+).

Third, attention is directed to the fact that in Patterson, unlike the present invention, there is temperature control through the flow rate of electrolyte as opposed to the catastrophic method covered in the present invention, and uses a simple two electrode system with rudimentary beads.

42. The Office states that Patterson discloses,
"Either one of Patterson-1 or Patterson-2 discloses in Fig. 2 an electrolytic cell (12) filled with a liquid electrolyte (59) of heavy water, and having electrodes 15 and 16."

THE TRUTH - The Inventions are Totally Different

Actually, the inventions are vastly different. Patterson discloses an electrolytic cell consisting of cathodic beads located in a flow calorimetric system. Patterson's invention is a simple electrolytic cell consisting of beads and Patterson claims said rudimentary electrolytic cell filled with beads of mixed metals, arranged as cathodic beads, with the entire aggregation of beads then located in a flow calorimetric system. This is discussed in Patterson and Cravens 5,607,563 "System for Electrolysis", hereinafter Patterson-3. Thus, Patterson uses a pump (18 in Patterson; column 3 line 11), reservoir (32; column 3 line 12), slide valve (22; column 3 line 24), second slide valve (30; column 3 line 25), test reservoir (34; column 3 line 26), inlet and outlet stoppers (54 and 56; column 3 line 39-40), conductive palladium coated microsphere (36; column 3 line 54, and column 4 lines 41 through 60), a "conductive (sic) foraminous grid" (38; column 3 line 56).

Furthermore, Patterson strives for "electrolysis" as the titles, description and claims of Patterson 1, and 2 admit.

In addition, and thus, Patterson --as it claims-- is simply an electrolytic cell consisting of cathodic beads located in a flow calorimetric system. Patterson demonstrates the most rudimentary electrolytic cell and does not have the advanced technology, features, and advantages of the present invention. Patterson includes none of the features of the present invention. The methods described in Patterson are not the methods described in the present invention. The apparatus described in Patterson has none of the properties of the apparatus described in the present invention. Therefore, Patterson is not the same as a two-stage process involving loading of hydrogen into palladium discussed in the present invention's original specification and claims.

By contrast, the present invention is not a simple electrolytic cell consisting of beads, but in the preferred embodiment, a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal. This is the opposite of Patterson. In addition, by contrast, the present invention minimizes electrolysis, exactly the opposite of Patterson-1, 2, and 3.

This present invention is novel and not anticipated by Patterson 1 or 2 or 3. If the present invention, '765, was used as described in Patterson, it would not even work.

43. The Office states that Patterson reads on,
"Note that applicant's claim language of 'producing a change in the active quantity of isotopic fuel in material by a change in temperature of the material' reads on either Patterson-1's or Patterson-2's process of 'controlling the electrolyte temperature by changing the flow rate."

THE TRUTH - Patterson controlling flow rate to control temperature involves Patterson's temperature measurement vs. this Inventions Method

The Examiner ignores that Patterson is NOT this invention, and that controlling an electrolyte temperature is not changing with control the temperature of a loaded metal after loading. The Examiner has now broached dishonesty. Patterson discloses an electrolytic cell consisting of cathodic beads located in a flow calorimetric system. Patterson uses a pump (18 in Patterson; column 3 line 11), reservoir (32; column 3 line 12), slide valve (22; column 3 line 24), second slide valve (30; column 3 line 25), test reservoir (34; column 3 line 26), inlet and outlet stoppers (54 and 56; column 3 line 39-40), conductive palladium coated microsphere (36; column 3 line 54, and column 4 lines 41 through 60), a "conductive (sic) foraminous grid" (38; column 3 line 56). Patterson's invention is a simple electrolytic cell consisting of beads and Patterson claims said rudimentary electrolytic cell filled with beads of mixed metals, arranged as cathodic beads. Patterson strives for "electrolysis" as the titles, description and claims of Patterson 1, and 2 admit.

All of this is quite different from THIS INVENTION.

Although discussed in the previous communication from the Applicant, including on pages 23-28, the Examiner has minimized and ignored the critical errors of Patterson.

44. The Office states that Patterson discloses,
"A plurality of conductive microspheres (36) having a uniform outer palladium coating are positioned within the housing (14). See, for example, Patterson-1, column 3, lines 54+ and column 4, lines 21+."

THE TRUTH - ERROR - Patterson ignores Gauss' Law

The Examiner ignores that Patterson is NOT this invention, and that Patterson ignored Gauss' Law. Patterson discloses an electrolytic cell consisting of agglomerated cathodic beads located in the center of a flow driven by a pump (18 in Patterson; column 3 line 11), using a reservoir (32; column 3 line 12). Examination of the electrostatics and electrodynamics of Patterson reveals that Gauss' Law was ignored in the flawed Patterson design because there will be no electric field intensity withing the out boundary of the conductive spheres (similar to a Faraday cage).

PATTERSON ERROR - ERROR - Vertical Calorimetric Error

45. Patterson's numbers are in error because Patterson ignores and missinterprets thermal bouyancy. The Patterson microsphere-CETI system did not work at the superlative levels reported (ie. kilowatts). This was because it was designed to be a flawed vertical flow system [confer Swartz, M, "Potential for Positional Variation in Flow Calorimetric Systems", Journal of New Energy, 1, 126-130 (1996) and Swartz, M, "Improved Calculations Involving Energy Release Using a Bouyancy Transport Correction", Journal of New Energy, 1, 3, 219-221 (1996)]. There is a major potential error of vertical flow calorimetry - Bernard instability. Vertical low-flow calorimetry will give a false reading to anyone using it if Bernard instability [bouyancy factors] are ignored. Therefore, many scientists knowledgeable of the state-of-the-art prefer static calorimetry of uncalibrated vertical flow calorimetry such as Patterson uses.

In Patterson, the experimental setup is flawed in a way that diminishes its accuracy and utility. Simply put, Patterson ignores its dependance upon a vertical flow system and its magnification of the actual result when Bernard instability is not considered. Patterson's equation ignores the verical bouyancy flow errors. Corroborating this indelibly, in Patterson-3, Table 1 reveals that the delta-T (row 1, column 7) is - 0.3. This cannot be correct because warm water always rises. Patterson should have used the zero amount to correct the output to derive a semiquantitative derived value from the observed instead of magnifying the output.

With Patterson, the invention is simple and flawed, and there is a failure of adequate calibration in the initial studies as the cited patent, Patterson-3, reveals. The result is that Patterson's data is flawed. The mere plugging of numbers into a formula does not necessarily mean that the derived value is accurate unless the formula(e) applies to the experimental setup. This was discussed in Swartz, M, " Potential for Positional Variation in Flow Calorimetric Systems", Journal of New Energy, 1, 126-130 (1996) and Swartz, M, "Improved Calculations Involving Energy Release Using a Bouyancy Transport Correction", Journal of New Energy, 1, 3, 219-221 (1996). Patterson has inaccurate data because it missinterpreted the amount of heat because of thermal bouyancy and Patterson's error of omission of considering it in Patterson's vertical flow system. In Patterson, the mere plugging of numbers into a formula used in a flawed way diminishes its derived value and accuracy.

In summary, attention is directed to the fact that in Patterson, unlike the present invention, there is temperature is control through the flow rate of electrolyte as opposed to the catastrophic method covered in the present invention, and uses a simple two electrode system with rudimentary beads. '765 contains many additional critical features, components, etc., which are not found in Patterson or any of they other references. These features enable Applicant's invention to function differently from the cited references and to produce a different result.

LAW

46. Applicant respectfully notes that this was discussed in the previous Communication but has not been addressed with specificity and precision. These patents are very different. They do not disclose a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal of the cathode. The material of Applicant's invention, '765 does not read on the Examiner's cited art. Furthermore, it is improper to compare the cited art to the present invention for several reasons which the Applicant already discussed with the Examiner, but to which the Examiner has NOT yet completely and substantively responded. In particular, as to Section 102 rejections, it is stated in M.P.E.P. 706.2 that:

'The distinction between rejections based on 35 USC 102 and those based on 35 USC 103 should be kept in mind. Under the former, the claim is anticipated (emphasis added) by the reference.

In this same connection, The Court of Customs and Patent Appeals said in *In re Arkely, Eardley and Long*, 172 U.S.P.Q. 524, 526 (CCPA, 1972):

'It is to be noted that rejections under 35 USC 103 are proper where the subject matter claimed 'is not identically disclosed or described'(emphasis by the Court) 'in the prior art,' indicating that rejections under 35 USC 102 are proper only when the claimed subject matter is identically disclosed or described in 'the prior art'.

Therefore, given the above, the independent claims, and hence all claims, distinguish over the reference cited under Sec. 102. Thus, the present invention, a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal, is novel, is not obvious, and does distinguish from all previous art. Given the above, the Examiner should be fair, should answer the Declarations, should thereby answer the previous Orders of the Board, and should answer with specificity all explicitly discussed issues herein and in the previously submitted but substantially ignored response, or after reconsideration with respect to novelty (Sec. 102), allowance is respectfully requested by the Applicant.

RE: 35 USC §112 first paragraph REJECTION

47. The Office states,

"Claims 1-10, 12-19, 21, and 22 are rejected under 35 U.S.C. 112, first paragraph"

THE TRUTH - The Purported Reasons Do Not Relate To The Present Application

This Response by the Office is absolutely non-responsive to much of Applicant's previous communication from the applicant to the examiner, dated 12/3/02. There was a certificate of mailing on page 95 therein.

The nature of the invention, along with introduction of some of the Declarations, was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, on page 11 and 12. The operability of this invention was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, including on pages 57 through 85. Where is the Examiner's substantive response? The Examiner has ignored many of the Applicant's detailed Arguments.

In place of a cogent step-by-step substantive response, the Office handwaves and presents new arguments [some of which are deeply flawed and simply wrong for several reasons - accuracy, quality, and relevance]. This is improper and not consistent with the standards of review. In fact, as a result of ignoring the Evidence, the Examiner repeats again several general errors of fact, this time compounded into scientific errors. The general errors and the scientific errors are addressed in detail below, and again rebutted with specificity.

POINT 1: The Examiner's Communication Does Not Discuss The Invention As It Was Actually Taught, But Is Cut Of A Cloth Other Than This Invention

48. With the exception of a single net post, the Examiner's references do not apply to the present invention, but rather are criticism of other work in the field, "FP" (for Drs. Fleischmann and Pons), or involve experiments which were not done using the techniques taught in the original specification and claims of the above-entitled application (thereby actually indirectly proving the utility of the present Application). The Examiner deviates from the present invention, and upon his systematic improper reference to other art ("FP" or "F+P") which he purports did not exist or was flawed, again makes a false segue to attempt to invalidate the Applicant's independent work over more than a fourteen years which has been described in more than forty papers in peer-reviewed scientific journals.

The law states that enablement must be judged on this original specification and claims. The present invention is not the work of Pons and Fleischmann or their subject matter. The Examiner's continual referral to other much less relevant art is not really a rebuttal of this invention, but is a prejudicial attack against the Applicant, in disguise despite the Examiner's handwaving otherwise.

CONCLUSION: If the Examiner must rely upon reference to art cut of a cloth other than this specification and claims, then his position must indeed be quite weak.

POINT 2: The Absence of Evidence is Not Evidence of Absence

49. Several of the Office's references cited by the Examiner involve so-called purported "negative" results in that no large numbers of neutrons were observed. However, neutron emission is not expected in large amounts with these reactions (*vide infra*). Because the actual generation of neutrons is so unlikely, the absence of neutrons can not be inferred to indicate the absence of any other reaction or reactions. The absence of neutrons is not the evidence of the absence of fusion of isotopic fuels in a material.

Furthermore, not all of the art cited by the Examiner is "negative" with respect to neutrons as the Office purports. Actual "positive" evidence noted by the Examiner includes Rehn, Shani (who did monitor stimulated neutron radiation from deuterated materials after said deuterated materials were neutron-irradiated), and Faller (who did report a tritium increase). Thus, the Office's art, Rehn, Will, Shani, Faller, and others, cited by the Office, support the existence of the field.

POINT 3: The Examiners "Evidence" Has Already Been Proven Flawed [but Ignored By the Examiner]

50. The art supplied by the Office is outdated, not peer-reviewed, not relevant, and flawed. Such yellowed, brittle newspapers, and "ancient" reports have poor quality and cannot disprove the evidence the Applicant has presented regarding operability or utility. Several of the Examiner's references are flawed for reasons previously submitted by the Applicant, as discussed by the Applicant in the previous communication. Said so-called "negative" experiment papers from 1990-1991 contain serious errors and their errors are echoed thereafter in the Office's cited art (Huizenga, Taubes, and Jones). Simply put, these experiments were not done well and were contested in the peer-reviewed literature. Lewis, Miskelly, and Hilts have been and remain contested by scientists in published peer-reviewed literature (Miles 94B, Noninski 91, Noninski 93) and other art (Mallove 91, Milton 96). Most of the periodicals and newspapers cited by the examiner involve merely quoting the so-called "negative results" of others, either Alibagli (eg. Hilts) or Lewis *et alia* (Hilts, Browne), even though they remain validly contested and, therefore, they must be weighed accordingly. Furthermore, the Applicant's inventions surmount the problems so criticized therein, and these issues have been discussed in the applicant's peer-reviewed published papers, and in the Applicant's other patent applications [*vide infra*]. Applicant has already addressed the errors of Huizenga, Jones, Morrison, Miller, etc. previously with solid substantive response, including in Federal Court [A316-317,A321].

POINT 4: Applicant's Peer-Reviewed Publications Prove Enablement

51. The Examiner has not been fair. For example, where are the Examiner's substantive responses to the several other publications which the Applicant has published in Fusion Technology (of the American Nuclear Society) and elsewhere which demonstrate operability and utility [validation]? These include, but are not limited to, the following: Swartz, (1994B) "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4. "Proceedings: "Fourth International Conference on Cold Fusion", EPRI and Office of Naval Research, Swartz (1998), Improved Electrolytic Reactor Performance Using π -Notch System Operation and Gold Anodes, Transactions of the American Nuclear Association, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85, Swartz. (1997), Fusion Technology, 31, 63-74, 1997, Swartz (1999), "Generality of Optimal Operating Point Behavior in Low Energy Nuclear Systems", Journal of New Energy, 4, 2, 218-228 (1999), Swartz, 1997, "Consistency of the Biphasic Nature of Excess Enthalpy in Solid State Anomalous Phenomena with the Quasi-1-Dimensional Model of Isotope Loading into a Material", Fusion Technology, 31, 63-74, Swartz, 1998 "Optimal Operating Point Characteristics of Nickel Light Water Experiments", "Proceedings of ICCF-7", and Swartz, 1997, "Biphasic Behavior in Thermal Electrolytic Generators Using Nickel Cathodes", IECEC 1997 Proceedings, #97009; Swartz, 1998. Where is the Examiner's Response to Swartz, 1998, Improved Electrolytic Reactor Performance Using π -Notch System Operation and Gold Anodes, Transactions of the American Nuclear Association, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85?

Where are the Examiner's substantive responses to the Applicant's publications in peer-reviewed journals with evidence demonstrating that he has correctly taught operability and enablement regarding loading and loading flux? These include Swartz. M., 1994 "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4. "Proceedings: "Fourth International Conference on Cold Fusion", sponsored by EPRI and the Office of Naval Research, and Swartz, M., 1997, "Hydrogen Redistribution By Catastrophic Desorption In Select Transition Metals", Journal of New Energy, 1, 4, 26-33, but also Swartz, M, 1998, Transactions of the American Nuclear Association, Nashville, 78, 84-85, Swartz, M., "Quasi-One-Dimensional Model of Electrochemical Loading of Isotopic Fuel into a Metal", *Fusion Technology*, 22, 2, 296-300 (1992), Swartz, M., "Possible Deuterium Production from Light Water Excess Enthalpy Experiments Using Nickel Cathodes", *Journal of New Energy*, 1, 3, 68-80 (1996), M. R. Swartz, "Generalized Isotopic Fuel Loading Equations", "Cold Fusion Source Book, International Symposium On Cold Fusion And Advanced Energy Systems", Ed. Hal Fox, Minsk, Belarus, May (1994), Swartz, M., "Isotopic Fuel Loading Coupled to Reactions at an Electrode", Vol. 4, Proceedings: "Fourth International Conference on Cold Fusion", *ibid.*, 33 (1994); Swartz, M., "Isotopic Fuel Loading Coupled To Reactions At An

Electrode", *Fusion Technology*, 26, 4T, 74-77 (December 1994), M. R. Swartz, "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4, *Proceedings: "Fourth International Conference on Cold Fusion"*, sponsored by EPRI and the Office of Naval Research, December (1993).

Where are the Examiner's substantive responses to the Applicant's publications in peer-reviewed journals which have taught standards and quality control ("Q/C") which are relevant to experimental operability? These include Swartz, 1997 ["Patterns of Failure in Cold Fusion Experiments, Proceedings of the 33RD Intersociety Engineering Conference on Energy Conversion, IECEC-98-I229, Colorado Springs, CO, 1998], Swartz 1996 ["A Method To Improve Algorithms Used To Detect Steady State Excess Enthalpy", *Transactions of Fusion Technology*, 26, 156-159], but confer also Swartz, "Improved Calculations Involving Energy Release Using A Buoyancy Transport Corrections", *Journal of New Energy*, 1, 3, 219-221 (1996); Swartz, "Potential for Positional Variation in Flow Calorimetric Systems", *Journal of New Energy*, 1, 126-130 (1996)]; Swartz, "Definitions Of Power Amplification Factor", *J New Energy*, 2, 54-59 (1996); Swartz, "Explanations for Differences Between Reports of Excess Heat in Solid State Fusion Reactions", *J. New Energy*, 2, (1997); Noise in Cold Fusion Systems", *J. New Energy* for Fall 1997; Swartz, "Relative Impact of Thermal Stratification", *J. New Energy*, 1, 2, 141-143 (96); Swartz, "Some Lessons From Optical Examination Of the PFC Phase-II Calorimetric Curve", Vol. 2, *Proceedings: "Fourth International Conference on Cold Fusion"*, sponsored by EPRI and the Office of Naval Research, December (1993), published July 1994).

Where are the Examiner's substantive responses to the Applicant's teachings of errors and artifacts which can give rise to false indications of "excess heat", Applicant's teachings of the analysis and measurement of thermal noise (Swartz 97B, Swartz 97F, Swartz 97D), means of calibrating said signals for long term analysis (Swartz 97E, Swartz 97D, Swartz 97C, Swartz 96C), correction for Bernard instability (Swartz 96D), correction for said noise (Swartz 97F), and for other types of artifactual signal (Swartz 97C, Swartz 96A, Swartz 94C, Swartz 94D).

The Applicant would like to know how many of Applicant's publications does it take in prestigious peer-reviewed journals before the Office (or Examiner) accepts the clear, substantiated, evidence that a technology exists? Applicant's publications in peer-reviewed journals confirm operability as taught years earlier in the original specification and claims.

POINT 5: The Skilled-In-The-Art Support Applicant

52. Where is the Examiner's substantive response to Applicant's cited Declarations, including the the Swartz declaration, the Declaration of Straus (4/22/94), and the *Amicus Curiae* Briefs of Drs. Edmund Storms (2/21/01), Talbot Chubb (2/22/01), Eugene Mallove (3/24/00) and Hal Fox (2/21/01)? In the new arguments made by the Office, there is no substantive response or answer to the Declarations previously submitted with the Applicant's last Communication to the Examiner even though the Affiants addressed operability and utility of this invention, and even though said Declarations were referred to and addressed several times by Applicant. The Office fails to indicate which, if any, of the averments (or pages) in the Declarations and *Amicus Curiae* Briefs have been formally considered by the Office and, if so, how they reached their conclusion.

The Declarations are evidence supporting the Applicant's position, and substantially and fully address all matters and issues criticized by the Examiner, and contain averments regarding evidence establishing the utility, validation, and operability of the Applicant's claimed subject matter. The Declarations contain factual statements directly addressing how the specification adequately described the subject matter recited in the claims. They demonstrate that a person of ordinary skill in the art would have understood the inventor to have been in possession of the claimed invention at the time of filing, and that the invention operates as stated, and as explicitly taught in the original specification and claims. The Declarations prove that the Applicant taught in the original specification and claims how his apparatus works and claimed the invention.

The Affiants, skilled-in-the-art, state that the "environment" in which the above-entitled invention operates "does exist" and that there is no evidence of "heat" and "loading". The Declarations include the Straus (4/22/94), Swartz, and other Declarations, including but not limited to the *Amicus Curiae* Briefs of Edmund Storms (2/21/01), Talbot Chubb (2/22/01), Eugene Mallove (3/24/00) and Hal Fox (2/21/01) and Affiants who have been the Office's own witnesses.

The Applicant would like to know how many Declarations does it take before the Office (or Examiner) accepts the clear, substantiated, evidence that a technology exists? The law says one. The Examiner will not answer and ignores dozens.

CONCLUSION: The Declarations remain ignored in their factual content because they rebut the Offices' erroneous position about operability and utility. Validation occurs when scientists actually skilled, and working, in the state-of-the-art state it to be so. Scientists write the technical papers which undergo peer-review, file the patents applications, and attend international conferences, disagree with the Examiner. Given that in this case there has been no response to, or dispute of, said Declarations the Office is obligated by law to assume that all Declarants assertions are true [Lewis v. Bours, 119

Wn.2d 667, 670, 1992], and therefore, the Examiner has erred by failing to consider those skilled-in-the-art who counter the rejection under 35 U.S.C. §112 and §101.

POINT 6: The Literature Supports The Applicant

53. Where is the Examiner's Response to the more than 300 publications which the Applicant has sent the Office taken from peer-reviewed journals? or his response to Swartz. M., 1994 "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4. "Proceedings: "Fourth International Conference on Cold Fusion", sponsored by EPRI and the Office of Naval Research? This has been several hundred pounds of Exhibits, including over 40 of the Applicant's own peer-reviewed papers (several published by the American Nuclear Society, *Fusion Technology*)? Instead of a substantive response, in the new arguments made by the Office, there is ignoring of data, Exhibits, and Declarations, which the Applicant has supplied. The Exhibits constitute significant, growing reputable evidence of record which easily overcomes the few "negative" showings in the Office's ancient references, allegedly "disproving" the concept of "cold fusion". In contrast to the few "nay-sayers" the Office cites over and over, and in contrast to the "older" books, papers, and newspapers which cite failed experiments to which the Office refers to in its new argument, stand the Applicant's submitted original specification and supporting published papers, facts, Exhibits, and Declarations which demonstrate both the quality and quantity of corroborations of the existence of these reactions. Applicant's peer-reviewed published literature in series of published reports has more evidentiary value than the few "negative" less-credible recycled, older reports cited by the Examiner which do not even mention Applicant's work.

Where is the Examiner's Response to the fact that the U.S. Electric Power Research Institute (EPRI) has obtained positive results (Swartz 97A), as has NASA (Neidra 96A, Neidra 96B), the French atomic energy agency [confirming the cold fusion effect as originally reported by Dr. Fleischmann and Pons (Lonchampt 97)], and many US laboratories including US NAVY? Instead, the Office relies on its rebutted "reports" from "science" reporters and those competing for Federal funds, all of whom do not even refer to the present invention. Nor have they been sworn in, or have been proven to be an expert, as the Applicant has done with his Declarants.

Where is the Examiner's Response to Applicant's citation of Dr. Miles reports that near commensurate "ash" (i.e. order-of-magnitude expected amounts or greater) consistent with a nuclear process was found linking the formation of helium-4 to the excess heat using metal flasks which were used to capture the helium-4 linked to the excess heat [Miles (1993); also "US Navy Continues Positive Efforts Supporting Cold Fusion"; COLD FUSION TIMES (pages 1-2) volume 1, number 4 (1994)]?

"Our previous results present a correlation between the measured excess power and helium production in D_2O -LiOD electrolysis cells using palladium cathodes. The measured rate of 4He production (10^{11} - 10^{12} $^4He/s*W$) is the correct magnitude for typical deuteron fusion reactions that yield helium as a product. *** Metal flasks were used to collect the electrolysis gas samples in order to minimize atmospheric contamination due to helium diffusion through glass. The helium concentrations in Table II support a detection limit of approximately 10^{13} $^4He/500$ mL in these experiments as reported previously. Mean values for the measured helium concentrations in these control experiments are $4.4 +/- 0.6$ ppb or $5.1 +/- 0.7 \times 10^{13}$ $^4He/500$ mL. ... For experiments producing excess power, five helium measurements using these same metal flasks have been completed. These experiments yield a mean value of $2.0 +/- 0.5 \times 10^{11}$ $^4He/s*W$ after correcting for background levels of helium measured in control studies (Table II). This value is once again the correct magnitude for typical deuteron fusion reactions that yield 4He as a product."**

[*"Heat And Helium Measurements In Deuterated Palladium"*; M. M. Miles and B. F. Bush, Chemistry Division, Naval Air Warfare Center Weapons Division China Lake, CA USA (12/1993)]

54. Where is the Examiner's Response to Applicant's citation of confirmations of Dr. Miles' nuclear (helium-4) findings? Excess heat, tritium generation, and other products, produced by the desired reactions, have been found by scores of groups supporting Applicant's claims at the time these patent applications were filed. The reactions products (particles and excess energy) have been elicited both by the electrodeposition of deuterons onto palladium cathodes and by temperature cycling of deuterided palladium or titanium. Many of the laboratories publishing such results are listed in a table in Dr. Mallove's book on pages 246 through 248. The chief product of the cold fusion reaction(s) is excess heat [Mills 91, 94; Mizuno 96D; Storms 93; Arata 90; Swartz 97B; Mizuno 96D; Celani 96A; Storms 96A; Pons 90; Notoya 93; Fleischmann 89, 90; Mallove (Fire from Ice); Lonchampt 96, 97; Oriani 96; Mizuno 94; Bockris 90; Szpak 91B, 96A; McKubre 91; Will 91; Nobel 95 and Miles 94C, 96B], but other released particles have also been reported {including tritium [Srinivasan, Current Science, 143 (1991); Chene 90; Rout 91; Storms, Fusion Technology, 17, 680 (1990); also Notoya 94A, 94B; Will 93, 94; Claytor 96A, 96B], sparse neutrons [Gozzi, J. Fusion Energy, 9, 241 (1990); Menlove, J. Fusion Energy, 9, 495 (1990); also Gozzi 90A, 90B; Ogawa 96; Perfetti 89; Wada 89; Bittner 91; Celani 97], other particles [Karabut 92; Chambers 91; Taniguchi 89; Iwamura 94], helium-4 [Bush, J. Electro. Chem., 304, 271 (1991); also

Miles 94C, Miles 91, 93B, 94C, 96B; Bush 96], some radiation [Szpak 96B; Celani (90)], and possibly heavy elements [Matsumoto, *Fusion Technology*, 20, 323 (1991), Karabut (92)) Matsumoto 92; also Ohmori 96A, 96B; Savvatimova 94, 95; Mizuno 96A, 96B, 96C; Miles 96C, 97A; Miley 96]{}.

The reports of these products support the incontrovertibility of this new nuclear technology. The Examiner's own witness, Dr. Will demonstrated tritium production ["Reproducible tritium generation in electrochemical cells employing palladium cathodes with high deuterium loading, *J. Electroanal. Chem.* 360 (1993) 161-176; confer also Will 1994]. Swartz (96B) describes several other reports of tritium production. Thus, based upon the above-discussed inadequacies of the art cited by the examiner, and most importantly based upon the growing abundance of "positive" more-recent literature there is evidence of fusion in a material using isotopic fuel.

Where is the Examiner's Response to literature supporting the measured products of the cold fusion reaction(s) including excess heat, but other released particles have also been reported {including tritium [Srinivasan, *Current Science*, 143 (1991); Storms, *Fusion Technology*, 17, 680 (1990)], sparse neutrons [Gozzi, *J. Fusion Energy*, 9, 241 (1990); Menlove, *J. Fusion Energy*, 9, 495 (1990)], helium-4 [Bush, *J. Electro. Chem.*, 304, 271 (1991)], and possibly heavy elements [Matsumoto, *Fusion Technology*, 20, 323 (1991)]}? Where is the Examiner's Response to Swartz(92), Swartz(94A), Swartz (97A) and Swartz(99), but also Mallove pp246-248, Storms(90,93); Arata(90); Celani(90); Pons(90); Bockris(90); Szpak(91B); McKubre(91); W l(91,93,94), Miles(94C,91,93B,94C); and McKubre, SRI ["Summary During ICCF-7", *Infinite Energy*, 4, 20, pp.34-35, (1998)]? Where is the Examiner's Response to (Hagelstein 93B), Storms (94C); Huggins 94, Savvatimova (94), McKubre (95), Itoh (95), Biberian (95), and Nobel (95), Kamimura (96), Lonchampt (6), Li (96A), Mizuno (96B), Kamimura (96); Miles (96C), Oriani (96), Claytor (96A), Celani (96B), Swartz 96B, Swartz 96A, Fox 96A, and Rothwell (96)? The vast number of papers in this field corroborates both the "existence" and the "utility" of these teachings.

55. Where is the Examiner's Response to the several hundred individuals who attend the conferences on the subject [ICCF-2, ICCF-3, ICCF-4, ICCF-5, ICCF-6, ICCF-7, ICCF-8, ICCF-9, and other meetings] who disagree with the Office's opinion.

Where is the Examiner's Response to any or all of the 9 volumes of the *Cold Fusion Times*? Where is the Examiner's Response to *Fusion Technology*, *Journal Of New Energy*, *Cold Fusion Times*, *Technology Review*, *Journal Of Electroanalytical Chemistry*, and *Journal Of Physical Chemistry*, etc., which publish on cold fusion despite the

Office's opinion. The vast number of papers in this field corroborates both the "existence" and the "utility" of these teachings.

Where is the Examiner's Response to Aspden (UK GB 2,231,195B), Czirr (5,231,290), Westphal (5,215,631), Patterson (5,036,031) which have the words "cold fusion" within them?

Where is the Examiner's Response to Fox 96A, 96B, Verner 96, Rothwell 95, Oriani 95, and writings by Dr. Storms ["Excerpts from Dr. Storms' Letter to Congressman Dick Swett and (U.S.) Congressional Hearing", and Storms, "Cold Fusion Heats Up", *Technology Review* (1994) and also see Storms 91, 95 and 96B], and Dr. Charles Beaudette [Beaudette Paxton Award paper (1994). *Cold Fusion Times* volume 1, number 4, page 5 (1994); *The Torch*, volume 66, pages 3-7 (1993)]. Despite the myopia of the Office's new argument, the cold fusion technology has been discussed by, and shown to be important to, some members of U.S. Congress [Mallove, "Cold Fusion and Alternative Fusion Are the High Points of U.S. Congressional Fusion Energy Hearing" *Cold Fusion Times*, volume 1, issue 2, page 1-2, 4, 8 (1993); Mallove, "Report of an Important Meeting with the U.S. Congress", *Cold Fusion Times*, volume 1, issue 3, page 1, 4, 8 (1993); Storms, "A very "unscientific" and personal take on other cold fusion effects", *Cold Fusion*, volume 1, issue 1, page 43 (1994)], Schwinger ["Cold Fusion: Does It Have A Future - Look to the rising sun", *Cold Fusion*, volume 1, issue 1, pages 14-17 (1994)], Rothwell ["Cold Fusion quietly takes off in Japan", *Cold Fusion*, volume 1, issue 1, pages 24-31 (1994)] and Rothwell ["Cold Fusion and History", *Cold Fusion Times*, volume 1, issue 2, page 6, (1993)]. Other examples showing the "pulse" of the field include Mallove, "Why 'Cold Fusion'?" *Cold Fusion*, volume 1, issue 1, pages 4-6 (1994), and Rothwell, "Cold Fusion quietly takes off in Japan", *Cold Fusion*, volume 1, issue 1, pages 24-31 (1994))?

56. The Applicant requests an answer to the question: How many publications does it take in prestigious peer-reviewed journals before the Office (or Examiner) accepts the clear, substantiated, evidence that a field of science and technology exists?

Where is the Examiner's Response to Applicant's citing where the Examiner has been, presumably inadvertently or unintentionally, in conflict with the law? For example, pursuant to In re Oetiker, Applicant hereby did respond in full to each of the Examiner's points with discussion in detail. For example, pursuant to In re Morris, Applicant did respond with information including those skilled-in-the-art. Furthermore, pursuant to In re Grey, Applicant presented other evidence including those of operability and utility, including in said Declarations [thereby also consistent with In re Porter].

POINT 7: Technical Issues Support The Applicant

57. Some of the Office's cited references are only theoretical criticisms. Furthermore, most of the Office's cited references involve poorly loaded, or otherwise inactive, samples as discussed by the Applicant in the previous communication. The Applicant has provided positive papers.

To the comment made by the Examiner's reference which incorrectly claims that no one in the field publishes negative results, this is false. The Applicant has published negative reports, including looking for metachronous particle emissions in experiments at MIT [M Swartz, "Possible Deuterium Production from Light Water Excess Enthalpy Experiments Using Nickel Cathodes", *Journal of New Energy*, 1, 3, 68-80 (1996)].

POINT 8: Factual Issues Support The Applicant

58. The Examiner has made so many errors of fact and law that they are briefly summarized below in alphabetical order. Several of these errors were avoidable if the Examiner had fully and completely read the Applicant's previous responses.

ERRORS OF FACT BY THE EXAMINER

— Error By Examiner Regarding Alibagli

59. The Office egregiously and odiously states to poison the record -- despite submitted unrebutted evidence from the Applicant,

"It is noted in this respect that there has essentially been a continuing stream of publications showing that virtually none of the scientific community consider the alleged positive results of cold fusion experiments as being confirmed. ... In this respect, Applicant's attention is directed to ... Alibagli et al ..."

THE TRUTH - The Examiner Cites Fraud Again

The Examiner cites Alibagli which contains PROVEN FRAUD as the Examiner ignores the US Navy, the US Air Force, NASA, RLE, the American Nuclear Society. It is consistent with Federal requirements of truth and accuracy that the Examiner disingenuously again relies upon and give authority to papers which now have been shown by independant scientific authorities to have major errors or have proven fraud. Several additional peer-reviewed publications (including Fusion Technology and J. Electroanal. Chem) have exposed many significant flaws in the cited so-called "negative" papers upon which the Office leans on. For example, independent analyses (Noninski, cf. also Mallove) indicate that the experiments of the Massachusetts Institute of Technology [MIT] and Lewis -- despite reported apparently "negative result" may have actually demonstrated excess heat in their experiments which utilized heavy water. Based upon his research, Noninski (93; 91B) has dismissed the references of Lewis, Miskelly, and those which cite early 1989 experiments at MIT's Plasma Fusion Center upon which the Examiner has so staunchly relied.

"Although much discussion was (and is still) devoted to whether ("cold fusion") is connected with any known nuclear reactions, the latter being widely questioned, there is no doubt that the general interest in the problem was provoked by the claim of the possibility of producing excess energy, i.e., energy surmounting the energy break-even value. Unlike the clearly negative indications so far in terms of known nuclear processes taking place, however, careful analysis reveals that the claims in the principal negative papers published so far with respect to the existence of excess energy are in disagreement with the raw experimental data whenever such is presented in those papers. This is very surprising indeed in view of the wide publicity these negative results have been given. An example of an improper analysis of their own experimental data by the authors is Ref. 1 (MIT Plasma Fusion Center Paper, Alibagli et alia), which we have already discussed. (ref. 2) Other examples of inappropriate method and improper interpretation of their own experimental data are (Lewis et alia) and (Miskelly et alia)."

[V. Noninski, Fusion Technology, vol. 23, pages 474-476 (1993).; "Notes On Two Papers Claiming No Evidence For The Existence Of Excess Energy During The Electrolysis Of 0.1 M LiOD /D2O With Palladium Cathodes"]

With all due respect, if the Examiner wishes to continue to quote altered data [Albagli] but continues to fail to cite, or explain the basis for ignoring, Applicant's evidence which was timely and repeatedly submitted [including in the Federal Appellate case regarding '457 in the Appendix therein at A203-204,A244,A278-A279,A3553-355,A367-A370,A391, and especially A368], then this communication shall demonstrate that personal notice was given of a Constitutional, statute, and civil rights violation, as well as Office communications containing knowingly disingenuous false statements known to be false *a priori* [Nehot'f v. Sahagian, 103 A.2d 211 (Me. 1954)] and is therefore a breach of duty [Rannard v. Lockheed Aircraft Corp., 26 Cal. 2d 149 (1945), 18 U.S.C. §1503]. The Office communication is thus in error [People v. Pierce, 66 Cal. 2d 53 (1967); U.S.v. Price, 86 S. Ct. 1152, 1157, footnote 7; Sawtelle v. Farrell, 70 F.3d 1381, 1387 (1st Cir. 1995); Leasco Data Processing Equip. Corp. v. Maxwell, 468 F.2d 1326 (2d Cir. 1972); Pizarro v. Hotels Concorde Int'l, C.A., 907 F.2d 1256 (1st Cir. 1990); Peckham v. Continental Casualty Ins. Co., 895 F.2d 830, 836 (1st Cir. 1990); Donatelli v. National Hockey League, 893 F.2 459, 465 (1st Cir. 1990)].

— Errors By Examiner Regarding Bosch, Balke, Rogers

60. The Office states,

"Applicant's attention is directed to ... Bosch et al, Balke et al, Fleming et al, Rogers. ... These references provide further clear evidence that no excess heat is generated in such "cold fusion" systems nor is there any evidence of nuclear reactions taking place."

THE TRUTH - The Examiner Cites Technical Incorrect Papers

The Examiner cites Bosch, who unseriously claims to be the "Bavarian Bubble Bottle Team"), who purportedly attempting to repeat the initial F+P experiment. Because the sensitivity of their system is 300 milliwatts (page 165), it is unlikely they would have been able to detect the expected signal with their calorimetry which was circa 65 milliwatts excess heat. Bosch measured neutrons which are not produced (discussed elsewhere).

The cited arts have loadings which are insufficient. The Bosch cathode had a loading of less than 0.67, and that did not include correction for other depositions of other materials into or upon the cathode (page 172). This loading is now known to be too low (Swartz 97A) The "negative" results may be, in part, due to inadequate loading (Swartz 07/339,976), and/or the failure to monitor said loading of isotopic fuel (Swartz, (07/371,937**), and/or to activate the loaded quantity of isotopic fuel in various ways (Swartz 07/339,976, Swartz 07/371,937** and Swartz 07/760,970**), and/or to drive at the right location (Swartz SN 08/406,457 [filed March 20, 1995]. As taught in Swartz 07/339,976, palladium must fill with, and thus physically absorb within it, enough deuterium to obtain the desired reactions.

The cited arts are not relevant. The Examiner cites Balke, which teaches a less relevant gas system which loaded palladium and titanium. The other references use neutrons.

The Examiner cites Rogers, which is a theoretical paper because some of the conclusions in Rogers are not inconsistent with cold fusion. For example, on page 484, Rogers discusses that gamma emission from the excited helium state is not allowed. This is generally correct except at very elevated temperatures (like hot fusion), and Swartz (97A) and Swartz 96B discusses how this actually enables the desired reactions.

== Errors By Examiner Regarding Blue

61. The Examiner inaccurately states:

"In Ref. X1, Dick Blue stated on the issue of confirmation of cold fusion results that "four years into this business, it seems we are still counting the simple replications of Excess heat' and failing to note that none of the replications match in any significant additional details."

In Refs. V2 and W2, Dick Blue lays out why there are problems with the "cold fusion" process."

The Applicant thanks the Examiner for the citation from Dr. Dick Blue, who the Applicant has cited in his peer-reviewed published papers, where the Applicant corrected some of his (and Jones') incorrect statements (*infra*). The Examiner cites a newsgroup posting by Dr. Blue from February 11, 1994. The Examiner quotes a posting from Dr. Blue; a reply to the Applicant from Dr. Blue dated February 11, 1994. In it, Dr. Blue discusses the work of others including Yamaguchi, and Miles. It is not relevant to the present invention except as it relates to F+P.

In it, Dr. Blue discusses cold fusion with Dr. Swartz. At the end of the posting, Dr. Blue -who is probably the most serious critic of cold fusion of the Internet- states, **"I want to thank Mitchell for his frank responses."**

The Examiner also presents postings from Dr. Blue on May 7, 1993 in which he discusses the products of cold fusion with the Applicant, Dr. Mitchell Swartz. Therein, Dr. Swartz takes the time to answer Dr. Blue and the Examiner is referred to the Applicant's answer on page 2 therein,

"also, the present information is that cold fusion ... has been confirmed in several configurations, has been tested by several respectable calorimetries, and is more complicated than first thought."

The Applicant did not share the technology of the present application (or the others) with Dr. Blue, but instead did refer his to the peer-reviewed published articles, and did correct Dr. Blue's scientific errors such as will now be discussed.

== Error By Blue And Examiner Regarding Special Relativity

62. The Office inaccurately states,

"In a 1992 article in Surface and Coating Technology, Jones take the position that the claims of excess heat, tritium and helium production due to nuclear reactions are "dubious to say the least" (note page 288) because there is no evidence of commensurate nuclear products. Note the reference to $E=mc^2$ on page 286."

THE TRUTH - THE EXAMINER Errs Regarding Special Relativity

In the Examiner's final citation of Dr. Blue, dated November 19, 1994, Dr. Blue discusses, albeit incorrectly, the Schrodinger equation. On page 2, Dr. Blue discusses the "the time scale for the transition process". Dr. Blue got it wrong, and the Applicant, Dr. Swartz, did fully completely, and accurately correct him in the peer-reviewed journal of

the American nuclear society [Phusons in Nuclear Reactions in Solids", Fusion Technology, 31, 228-236 (1997)].

Dr. Blue appears to have incorrectly derived the Schrodinger equation using "energy" rather than "the uncertainty in the energy". As the Examiner knows, the Schrodinger equation involves the relationship between either the uncertainties of mass and momentum or the uncertainties energy and time. In the case being discussed, the latter was invoked by Dr. Blue. As the Examiner knows, the product of the uncertainties is on the order of the number, called h-bar. Dr. Blue's error directly results from his use of the energy (E) rather than the uncertainty of energy (Delta-E.). This common error of those without adequate scientific eduation is discussed in significant detail in the Applicant's published paper "Phusons in Nuclear Reactions in Solids", Fusion Technology, 31, 228-236 (1997). Attention is directed to the section discussing special relativity therein where this matter is definitively and correctly discussed (after peer-review).

== Error By Examiner Regarding Broad, Dagani, etc.

63. The Office improperly offers "yellowed" newspaper and book accounts which are of questionable and low accuracy, and ignores Applicant's submitted evidence which was peer-reviewed by the American Nuclear Society. The Office disingenuously states,

"The Dagani article in the 1/14/91 issue of C & EN states that the "cold fusion" claims are taking seriously by virtually none of the scientific community and that research at Utah's National Cold Fusion Institute (NCFI) as well as research elsewhere, have failed to establish the existence of cold fusion."

The Broad article in the 3/17/91 issue of the New York Times indicates some of the data relied on by Fleischmann and Pons as showing evidence of fusion was faulty."

THE TRUTH -- The Examiner Errs Regarding Followup Efforts

The applicant discussed Dagani and the other matters once again improperly mentioned by the Examiner [who ignored the Applicant's previous responses which were in the previous communication to the Examiner on pages 83 through 84. It is unfortunate that the Examiner must have overlooked this matter inadvertently or unintentionally.

The Examiner has not explained why he unduly relies upon non peer-reviewed periodicals and books which do not discuss Applicant's invention as he ignores the submitted evidence of the Applicant regarding operability or utility.

The Examiner has not explained why he has ignored, and did not discuss, so many of Applicant's arguments in this matter. First, perhaps to promote sales of the newspapers, the Office quotes "headline" events without any substantial data being presented. And it is important to note that some "headlines" are simply wrong.

Second, such "headlines", as opposed to the peer-reviewed articles cited by the Applicant in Fusion Technology, are not fair representative appraisals of new technologies.

Third, this is another case where the Office again takes selected, functionally "old" and out-of-date, biased excerpts to attempt to prove its "point". However, the very newspapers which the Examiner has cited now publish updates which herald that there is increasing acceptance of, interest in, and growth of this field [cf. Freedman (Science 4/24/92), Chandler (Boston Globe 4/17/92)]. As a result, it is reported that scientists are "quite convinced that there is a source of heat" [Prof. Philip Morrison as reported in Chandler] and are "not concerned about the lack of neutrons (expected in a conventional) fusion reaction" [Prof. Louis Smullin as reported in Freedman]. Dagani (1992) now reports that growing numbers of the scientific community do take seriously the "excess heat". See also Chandler, Freedman, Bishop.

Fourth, the Office cites old (~1991) articles, but there are many periodicals -- more recent -- which do support this field including the Wall Street Journal (Bishop (92); Bishop (93), Bishop (96)), New York Times (November 17, 1992, Pollack, and especially Clarke 1997). There are many periodicals which do support this field including the Wall Street Journal (Bishop (92); Bishop (93), Bishop (96)), New York Times (November 17, 1992, Pollack, and especially Clarke 1997). The Examiner should note that the Applicant has now supplemented these with even more references.

The Examiner has not explained why he unduly relies upon irrelevant papers which are totally theoretical. Some of these "negative theoretical" citations calculate, using what may be incorrect or false assumptions and approximations, that fusion of isotopic fuel in a material, ie. cold fusion, can not "work" (eg. Ohashi, Cribier, Chapline). The applicant respectfully asks the examiner to reconsider, because in actual fact such calculations were historically presented "proving" that heavier-than-air ships (ie. airplanes) "cannot fly". As another example: such calculations only created a virtual "drag" to the innovation of ideas, and their development and implementation, involving airships - which later evolved to include jets and spacecraft.

"Professor Goddard ... does not know the relation of action to reaction ... he only seems to lack the knowledge ladled out daily in our high schools"

[New York Times, January 13, 1920]

"... after a few more flashes in the pan, we shall hear very little more of Edison or his electric lamp. Every claim he makes has been tested and proved impracticable."

[New York Times, January 16, 1880]

== Error By Examiner Regarding Flemming

64. The Examiner cites Fleming and other papers where the loading times are too short. For example, Fleming some were half a day, the longest was 5 days. Without the codepositional techniques taught in the original specification and claims of the above-entitled application, the times are weeks to achieve the desired reactions. Furthermore, the loadings were insufficient. Fleming only had a loading estimated at 0.75 (page 521). This loading is now known to be too low (Swartz 97A).

== Errors By Examiner Regarding Jones

65. The Office states,

"This apparent transformation of Jones from a "cold fusion believer" to "skeptic" is discussed by Dagani in the June 5, 1995 issue of C & EN."

THE TRUTH -- The Examiner Errs And Cites Less Than Relevant Work

The Applicant thanks the Examiner for the citation from Dr. Jones which is not relevant and is immaterial. It is interesting to watch Jones take both sides (see Taubes). and also publish the "positive" results in this field (Jones 89, Jones 90, Menlove and Jones et alia in Menlove 90B).

First, the Examiner should admit that Jones' positive work has been cited in issued US Patents including Czirr 5,231,290.

Second, the Examiner must accept that Jones now does again report neutron emission from these systems, as was presented this year at the APS meeting and then reported on in the Cold Fusion Times (Winter 2003 issue). The fact remain that Jones' experiment work now supports cold fusion.

**** - Attention is directed to the fact that Applicant's publications in peer-reviewed journals are NOT press releases or web-chatter unlike those on whom the Examiner relies and cites.

***** Furthermore, the Applicant reminds the Examiner that nearly all of the cited people by the Examiner do not conduct experiments now, and some (Huizenga, Taubes, Murray, etc.) never have. Instead they are professional critics, making an income from sales of their books gleaned by the Office's publicity on the matter.

The Office states,

"Jones et al in J. Phys. Chem. vol. 99, (1995) set forth reasons why the alleged obtainment of excess heat in cold fusion systems, can not be relied on as valid."

THE TRUTH -- The Examiner Errs On Jones' Errors Already Discussed

The Examiner cites Jones' claims, but the Examiner egregiously ignores that the Applicant has already submitted contradicting unrebutted evidence and discussed that evidence including the errors in Jones explained with solid substantive response [A205,A251-A252,A291-292,A322; also A65,A70] including Jones' significant errors (Miles 93A, Miles 94A, 96A, Cravens 96, Tinsley 97). Dr. Miles, as just one example, discusses in great and sufficient detail said errors contained in the Jones papers in his 20 May 1998 to Mr. Dagani, Senior Editor, Chemical and Engineering News

"Enclosed is a reprint of my recently published reply to Jones-Hansen [J. Phys. Chem. B. 102, 3642 (1998)]. It was a long and difficult battle for me to have the opportunity to reply to the vicious attack of my work by the Jones-Hansen paper [J. Phys. Chem., 99, 6966 (1995)]. In my opinion, their paper contained many distortions and errors concerning my publications rather than the reasonable scientific dialogue that is so badly needed for this field. Although critics like S.E. Jones and others have made it nearly impossible to obtain government funding for cold fusion, this research continues in many laboratories around the world. Unlike Jones and his 1989 report of cold fusion neutrons, I find no reason to retract any of my cold fusion claims. The recombination of deuterium and oxygen gases does not explain my excess heat measurements, and atmospheric contaminations do not explain my correlations between the excess power measured and the helium-4 produced in the experiments."

[Dr. Melvin H. Miles NAWCWPNS Fellow, DEPARTMENT OF THE NAVY
NAVAL AIR WARFARE CENTER WEAPONS DIVISION]

In addition, it is important to note that in addition to said errors, Jones has other significant errors as well which are not discussed in these cited references. For example, in Jones (95), the discussions of heat rate, thermoneutral potential, and input power are incorrect, and furthermore are not applicable to the present application and invention, as discussed in Swartz (96E) and Swartz (95, 97B).

== Errors By Examiner Regarding Japan

66. The Examiner inaccurately states:

"If cold fusion is real, demonstrable, or reproducible it would mean more to the Japanese than any other industrialized nation.

.... the Japanese have terminated their three-year multi-million dollar effort to demonstrate and commercialize cold fusion."

THE TRUTH -- The Examiner Errs Because Japan Has Always Had CF R&D

This disingenuous new argument by the Office, that "the Japanese have terminated their three-year multi-million dollar effort to demonstrate and commercialize cold fusion" is

wrong for several reasons. In fact, Japan pursued cold fusion before World War II (*Cold Fusion Times*, enclosed herein), and its efforts continue (*supra*).

First, Japan is made of many individuals and institutions, many of which continue cold fusion studies, and who disagree with the hearsay Office claim, as they diligently continue to publish, including [and each of which prove the Examiner and his cited art incorrect]: Arapi, Alban, Faculty of Engineering, Iwate University, Japan, Experimental Observation of New Element Production in the Deuteride and/or Hydride Palladium Electrodes Exposed to the Low Energy DC Glow-Discharge, *Cold Fusion Times*, Volume 10, Number 1, 2003; Arata, Achievement of Solid-State Plasma Fusion, *Cold Fusion Times* Fall 1997; Asami, T. Senjuh, T. Uehara, M. Sumi, H. Kamimura, S. Miyashita and K. Matsui R&D Center for New Hydrogen Energy, The Institute of Applied Energy 14-2, Nishishinbashi 1-chome, Minato-ku, Tokyo 105, Japan, Material Behavior Of Highly Deuterated Palladium, The Seventh International Conference On Cold Fusion. 1998; Iwamura, Yasuhiro, Takehiko Itoh, Mitsuru Sakano and Satoshi Sakai, Observation Of Low Energy Nuclear Reactions Induced By D2 Gas Permeation Through Pd Complexes, The Ninth International Conference on Cold Fusion. 2002. Beijing, China: Tsinghua University.; Iwamura, Yasuhiro, Mitsuru Sakano And Takehiko Itoh, Advanced Technology Research Center, Mitsubishi Heavy Industries Ltd., 1-8-1, Sachiura, Kanazawa-ku, Yokohama 236-8515, Japan, Elemental Analysis of Pd Complexes: Effects of D2 Gas, *Jpn. J. Appl. Phys.* Vol. 41 (2002) pp. 4642–4650, Part 1, No. 7A, July 2002; Iwamura, Takehiko Itoh, Nobuaki Gotoh, Mitsuru Sakano, Ichiro Toyoda And Hiroshi Sakata, Detection Of Anomalous Elements, X-Ray And Excess Heat Induced By Continuous Diffusion Of Deuterium Through Multi-Layer Cathode (Pd/CaO/Pd), The Seventh International Conference on Cold Fusion. 1998. Vancouver, Canada:, ENECO, Inc., Salt Lake City, UT. : p. 167, J. Kasagi, H. Yuki, T. Itoh, N. Kasajima, T. Ohtsuki and A. G. Lipson, Anomalously Enhanced D(d,p)T Reaction In Pd And PdO Observed At Very Low Bombarding Energies, *Seventh International Conference On Cold Fusion*. 1998. Vancouver, Canada:, Eneco, Inc., Salt Lake City, Matsumoto, Taka-Aki, Hokkaido Univ, Japan, Generating Carbon Tubes And Films From Lead And Cadmium Wires During Underwater Spark Discharges, *Trans. American Nuclear Society, Low-Energy Nuclear Reactions* (2000), Mizuno, Tadahiko, Tadayoshi Ohmori 1 , Kazuhisa Azumi, Tadashi Akimoto And Akito Takahashi, Confirmation Of Heat Generation And Anomalous Element Caused; Mizuno, Tadahiko Tadayoshi Ohmori, Tadashi Akimoto, Hokkaido Univ, Japan, , Akito Takahashi, Osaka Univ, Japan, Neutronics, Heat and Products Induced by Plasma Electrolysis, *Trans. American Nuclear Society, Low-Energy Nuclear Reactions* (2000), Mizuno, Tadahiko, Experimental Confirmation of the Nuclear Reaction at Low Energy Caused by Electrolysis in the Electrolyte, *Proceedings for the Symposium on Advanced Research in Energy Technology 2000*, Hokkaido University, March 15, 16 and 17, 2000, pp. 95-106., Mizuno, Anomalous Isotopic Distribution after

electrolysis, Cold Fusion Times Fall 1996, Mizuno, Tadahiko, Nuclear Transmutation: The Reality of Cold Fusion, Department of Nuclear Engineering Hokkaido National University, Japan, Mizuno, Tadahiko, Tadayoshi Ohmori, Tadashi Akimoto and Akito Takahashi, Production of Heat during Plasma Electrolysis in Liquid, Jpn. J. Appl. Phys. Vol.39 (2000), Mizuno, Tadashi Akimoto, Tadayoshi Ohmori 1 , Akito Takahashi, Relation Between Neutron Evolution And Deuterium Permeation With A Palladium Electrode, The Ninth International Conference on Cold Fusion. 2002. Beijing, China: Tsinghua University., Takahashi, Akito Masayuki Ohta, Osaka Univ, Japan, , Tadahiko Mizuno, Hokkaido Univ, Japan, Radiation-Less Fission Products by Selective Channel Low-Energy Photofission, Trans. American Nuclear Society, Low-Energy Nuclear Reactions (2000).

Second, the Examiner's disingenuous statement is indelibly rebutted by said Japanese efforts including Mitsubishi's recent paper on cold fusion in China at the 9th International Cold Fusion meeting on 4/02 (*supra*).

Third, groups in Japan are simply not relevant to the present application.

Fourth, if the cited groups had followed the present original specification they would have succeeded.

The Examiner, trying to undermine US security and the US Constitution is directed to additional CF confirmations which have been made by the Japanese [Mizuno (December 1993); Yamaguchi 90].

"The cold fusion phenomena were tested with use of proton conductor solid electrolyte plates maintained at 300~400 deg C. An anomalous level of excess heat evolution of the order of 100 watt cm^{-2} was observed during absorption/desorption cycles of deuterium-containing hydrogen gas under application of an alternate electric field. **** Samples were made from a mixture of SrCO_3 , CeO_2 , Y_2O_3 and Nb_2O_5 powders. **** The heat generation from the proton conductor in the experiment of deuterium-containing hydrogen gas was estimated to be approximately 50 watt (~100 watt cm^{-2}) over 20 hrs, or ~3.6 MJ in total. The input power given to the sample was +18 V, +/- 40 (micro) A, or 7.2×10^{-4} watt. Accordingly, the output-to-input power ratio was estimated to be as large as 7×10^4 ."

["Anomalous Heat Evolution from SrCeO_3 -Type Proton Conductors during Absorption/Desorption of Deuterium in Alternate Electric Field"; Tadahiko Mizuno, Michio Enyo, Tadashi Akimoto and Kazuhisa Azumi Hokkaido Univ., Sapporo, Japan (ICCF-4, December 1993)]

67. Despite the incorrect statements by the Examiner, similar confirmations of cold fusion and continued efforts have been made by the Chinese [Jin (December 1993); Li (95, 96A, 96B, 97), Jin (93, 94)].

"The experimental studies of YBCO-D system indicated that YBCO high temperature super-conductor (HTSC) was shown to have a similar effect on deuterium absorbability and anomalous nuclear effect like palladium(1). We found that $Y_1Ba_2Cu_3O_7-d$ could absorb deuterium at normal temperature and forms $D_xY_1Ba_2Cu_3O_7-d$. We also found that the deuterated YBCO could produce high energy charged particles far larger than background. The influence of the absorbed deuterium on the characteristic of YBCO HTSC and the mechanism of the anomalous nuclear effect are not clear and needed to be further studied."

[**"Deuterium Absorbability And Anomalous Nuclear Effect Of YBCO High Temperature Super-Conductor"; Jin Shang-Xian, Zhan Fu-Xiang And Liu Yu-Zhen, En Beijing, PRC (ICCF-4, December 1993)]**

68. Also inconsistent with the Office's opinion and attempt to hurt the United States and its citizens, are Russia's reports also confirming cold fusion. For example, Kucherov (1993) has confirmed the cold fusion phenomena in the gas glow discharge system.

"The results of four years of experimental work on glow discharge in deuterium with cathodes made of palladium and other materials are presented. About 500 experiments were made. **. Neutron spectra showed neutron energies up to 17MeV with anomalous shift to high energies (five orders) relative to d-d reaction. .. Gamma-spectrometry showed low level radioactive isotopes formation. Together with half - life time measurements it allowed to identify some of the isotopes, such as Rh and Sr isotopes. Most of the lines (~100) are still unidentified. Non-background gamma-lines sometimes can be seen for few days. Most of the gamma-lines appear in lower than 300KeV region. X-ray films outside the chamber with led screens show some beam-like spots with energy 100-200 KeV. Charged particles registration with SSB and CR-39 detectors showed good correlation of the results obtained by these methods. Maximal observed fluxes of charged particles were $\sim 10^6 S^{-1}$. **** X-ray film with lead screens showed X-ray fluxes up to 10gs.] with soft (<1KeV) and hard (10-30KeV) components. Sometimes characteristic X-rays of palladium can be seen with Ge-Li detector."**

[**"Calorimetric and Nuclear Products Measurements at Glow Discharge in Deuterium"; Yan Kucherov, Alexander Karabut, Irina Savvatimova Scientific industrial Association "Luch", Podolsk, Moscow Region, Russian Federation (1993)]**

Thus, there is growing evidence that the Office's opinion that cold fusion "does not exist" is incorrect, but is only made to usurp the United States Constitution, Congressional directive, law, custom, and Applicant's rights. Said evidence includes reports of the progress of cold fusion reveal a real scientific field in Japan, India, Russia, England and France [**"Cold Fusion in Japan"**, Rothwell, *Cold Fusion Times*, v. 1, issue 3, page 1, 7, 9, (1993) and **"Cold Fusion Impact - Global Response:"**, Fox, *Cold Fusion Times*, vol. 1, issue 2, p. 2, 5 (1993), Mallove, **"Cold Fusion"**, May 1994 issue, vol 1

number 1]. The Examiner should consider "Why there?" The answer is this. Research has flourished mainly in those countries (Lonchampt 96) where patents issue.

As stated in the unrebutted Declaration of Mr. Fox,

"Few other countries have denied cold fusion inventors the rights to the fruits of their ingenuity. The most telling evidence is the fact that scores of patents on cold fusion have issued in other countries (over one-third of all patents issued have been to Japanese inventors and assignees). By contrast almost no patents on cold nuclear fusion have been granted by the U.S. Patent Office"

[Declaration of Hal Fox]

Therefore, the Applicant respectfully requests that the Examiner respond honestly to Applicant's submitted evidence about Japan, and then finally, tardively, admit the Office is incorrect. Work on cold fusion began in Japan before World War II and continues to this day. The US is now 14 years behind other countries because of the US Patent Office denies allowing valid patents to issue, thereby systematically ignoring both Constitutional and Congressional directive.

== Error By Examiner Regarding Harwell

69. This latest new argument by the Examiner involves citations of the 1989 Harwell experiment. However, was there no evidence of any excess heat generated in any of the Harwell cells? Harwell had flawed analysis, and as the Examiner knows, but ignores and fails to comment upon, was shown by the U.S. Navy, upon close analysis, to have had positive results in Cell 3. Melich and Hansen (Melich 93) have reported that:

"In Harwell's D₂O Cell 3 there are more than ten time intervals where an unexplained power source or energy storage mechanism may be operating.
*****Harwell Cells 1,2,3 and 4 were wired in series to a constant current source.**
***** Throughout these anomalous increases in temperature in Cell 3, Cell 4 behaves "normally", i.e., it suffers no unexplained pulses of energy. Our initial estimate of the power associated with these anomalous temperature increases is 100-200 mW."**

{Melich, M.E., Hansen, W.N., "Some Lessons from 3 Years of Electrochemical Calorimetry", in ICCF-3 Frontiers of Cold Fusion", Academy Press (1993), underlined for emphasis] Thus, Harwell's cell 3 supports the characterization of "positive results".

== Errors By Examiner Regarding Huizenga

70. The Office states,

"Applicant's attention is directed to Huizenga"

THE TRUTH -- The Examiner Relies On Old Inaccurate Books

This citation of Dr. Huizenga's book is a new argument by the Office. It is a flawed new argument for several reasons ranging from relevance, to timeliness, to accuracy, and to the role of theory, and reliance upon fraud, upon which the book begins and ends.

First, the book has NOTHING to do with the present invention.

Second, the book is not up-to-date with respect to cold fusion, nor is it accurate. Most importantly, this book focuses on a few mistakes of a few individuals from 1989, and does not reflect either the science or engineering of the field in general today, or the present invention specifically.

Third, Huizenga's book and its unsubstantiated and inaccurate statements and claims have been criticized by many including Mallove (94; see also his Declarations). Dr. Huizenga would pass off the entire field as "pathological science", but given that he fails to read the literature, or respond to the issues in his book, his entire premise must be examined. Dr. Eugene Mallove, historian and scientist, has made some compelling comments about this phrase used against those in the field of cold fusion

"Pathological science" became the common insult, as few noticed that pathological skepticism about a new phenomenon was the real problem. Contrary to the media's perception, cold fusion never died and was certainly never disproved; it simply went underground as groups of courageous scientists in over a dozen countries mounted a concerted effort to understand and reproduce the mysterious phenomenon. Thanks to their hard work, it has survived."

[Mallove, *"Cold Fusion"*, May 1994 issue, vol. 1, number 1]

Other discussion of the errors in Huizenga was made with solid substantive response [A206,A243,A275-276,A279,A294-295 in the Federal case and elsewhere] although it is systematically ignored by the Examiner to deprive the Applicant of his Constitutional and civil rights. Where is Huizenga's or the Office's response?

Fourth, attention is drawn to the simple fact that no "Epilogue" by one writer can refute the copious -- and growing -- data which exists for cold fusion. Many attendees at the ICCF-4 meeting in Maui (including the Applicant) watched the elderly tired Dr. Huizenga sleep on a couch in the hotel during said Conference; even as three (3) simultaneous meetings were going on at that time. Dr. Huizenga appeared tired and worn, woke up later, after missing scores of meetings, and reported that there was "nothing new". This is preposterous and inaccurate, but Dr. Huizenga is entitled to his inaccurate opinion and his sleep.

Fifth, Huizenga's book relies on theories against cold fusion because of the unusual (compared with hot fusion) branching ratio. Some of these "negative theoretical" citations by the examiner calculate, using what may be incorrect or false assumptions and approximations, that fusion of isotopic fuel in a material, i.e. cold fusion, can not "work" (e.g. Ohashi, Cribier, Chapline). There exist other theoretical papers which may explain the observed cold fusion phenomena (e.g. Hagelstein 90, 91, 1993A, 94; Takahashi (91), Swartz 1992, 94A, 96B, 97A, 97B; McNally 89; Hora 93; Johnson 94; Mills 94; Mills 95;

Li 95; Kim 90, 94A, 94B, 95, 96; Matsumoto 89; Chubb 90, 91, 94A, 94B; Szpak 91; Tajima (90); Schneider 89; Rice 90, Zhu 90, and Bush 91A). These theories involve loading, material destruction, and nuclear reactions including tunneling, screening, and many other issues. These papers reflect solid research and support the existence of the field but are ignored by the Office. The applicant respectfully asks the Board to reconsider, because in actual fact such calculations were historically presented "proving" that heavier-than-air ships (i.e. airplanes) "cannot fly". Such calculations only created a virtual "drag" to the innovation of ideas, and their development and implementation, involving said airships - which later evolved to include jet planes and spacecraft.

"Professor Goddard ... does not know the relation of action to reaction ... he only seems to lack the knowledge ladled out daily in our high schools"

[New York Times, January 13, 1920]

71. The Office states,

"note the following comments by Huizenga (IV) under the heading Reproducibility"

"Note particularly pages 1 25, 222, 223, of Huizenga (1) which refer to the lack of reproducibility of the alleged "positive" cold fusion results."

THE TRUTH - Reproducibility Is A Relative Issue

The Office brings up a new argument about the purported non-"reproducibility" of these phenomena, as a "reason" for rejection. However, there are several errors with this logic and new argument.

First, the Examiner's and his cited art's arguments are clouded by the two different meanings of the word(s) "(not) reproducible". In the parlance of the Office, when referring to "cold fusion", the word(s) "(not) reproducible" are a euphemism for "wrong". When used more generally, however, these words can even apply to scientific (and medical) fields which actually do engender respect and/or validity, and where "reproducible" only refers to the number of samples in a cohort developing the desired effect. The restriction that the Office creates using the word "reproducible" in the present case would obviously create unreasonable hurdles for inventors in such fields as cancer treatment, meteorology, or the sciences of earthquakes, lightning, sunspots, or solar storms.

Second, despite the erroneous logic of the office, radiation therapy accounts for the cure of more than 60% of adults afflicted with solid tumors composed of malignant disease, and obtunds the pain in 80% (or more) of patients treated palliatively, there is almost always a clinical effectiveness. Yet it is not possible to know in advance which patients are going to be cured nor is it necessarily reproducible in any single patient. Thus there is clinical proof and utility, despite the lack of reproducibility in any single individual or cohort of patients. Thus, the claim that "reproducibility" must necessarily be absolute for there to be "utility" is also simply not true. Would the Examiner withhold curative treatment of a patient --of their own family member-- because such therapy is not

"reproducible"? In summary, if the Office throws out cold fusion patent applications because there is not 100% reproducibility for each experiment, then probably all of the pharmaceutical and biomedical device patents should, for similar reasons, be voided *nunc pro tunc*.

== Error By Examiner Regarding Merriman

72. The Office states,

"Applicant's attention is directed to ... Merriman et al"

The applicant thanks the Examiner for providing a copy of the website of Dr. Barry Merriman. Dr. Merriman has made several comments about Dr. Swartz. One of those comments is in the last page of the Examiner's cited art.

The Examiner cites a paper by Dr. Barry Merriman, entitled "An Attempted Replication of the CETI Cold Fusion Experiment". In the paper, Merriman attempts to reproduce an experiment of someone other than the Applicant, and of a system other than the present application or any of the other applications of the Applicant. Therefore, Merriman is not relevant.

Most importantly, it is presumed that the reason that the Office cited this paper is because Dr. Merriman cites the Applicant, Dr. Swartz, on page 17, of 17. On that page, although Dr. Merriman is critical of many people in their efforts stating that they are "neutral -- to wildly optimistic", but of the Applicant of the above-entitled invention, Dr. Merriman states,

"Dr. Mitchell Swartz is cold fusion times is unabashedly pro -- CF, but serious, scientifically oriented online magazine."

With that complement by the offices witness supplementing the unrebutted Declarations and the copious unrebutted peer-reviewed publications [including Swartz. M., 1994 "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4. "Proceedings: "Fourth International Conference on Cold Fusion", sponsored by EPRI and the Office of Naval Research] and other Exhibits, the Applicant now hopes the Examiner will reconsider and issue this patent.

== Error By Examiner Regarding Miller And Bass

73. The Examiner inaccurately states:

"... attention is directed to the MEMO (dated 10/9/97) from Bennett Miller to Dr. Robert W. Bass. ... the conclusion of the Miller Memo is that there is still no concrete evidence of excess heat ... Abide by the process."

THE TRUTH - The Examiner Errs By Citing Someone Opposed To Solar-Cells And Alternative Energy

In new argument by the Examiner in the above-entitled application, the Examiner cites Dr. Miller extensively. There are several problems with this citation.

First, Miller does not discuss this invention or ANY of Applicant's work (published and/or unpublished). It is therefore not relevant. Miller is admittedly INCONCLUSIVE. Miller states that "it can be argued that the tests were inconclusive for a number of reasons".

Second, Miller is technically inaccurate about cold fusion situation in Japan. Miller confuses the Toyoda/IMRA effort (with F+P in Sophia Antipolis) with the IAE-NHE Laboratory (Shin Sapporo) which was under the aegis of MITI/NEDO and was officially "closed" after 3.5 years of an intended 3 year effort.

In fact, Japan pursued cold fusion before World War II (*Cold Fusion Times*, enclosed herein), and its efforts continue (*supra*).

Third, Miller suggests the use of peer-review. As discussed in the Verner Declaration, the Applicant has done just that,

"I have witnessed Dr. Swartz operate his equipment in front of visitors to the laboratory including Professors Louis Smullin and Keith Johnson from MIT and others."

Applicant has submitted more than 40 peer-reviewed papers and that is abiding by the process, as the Examiner surely would agree. What could be more compliant with Miller's suggestions than that?

Fourth, discussion of errors in Miller, was previously made with solid substantive response [e.g. in the Federal Appendix A316-317, A321]. Where is the Examiner's response?

Fifth, it appears that Miller was also against solar-cell technology in the '70s and therefore has a history of opposing alternative energy sources (like solar cells), and his opinion must be further discounted accordingly.

Sixth, the Applicant includes a letter which he wrote to Dr. Miller about his cited, inaccurate, report. Dr. Miller never responded to that to this date.

== Errors By Examiner Regarding Morrison

74. The Office states,

"In this same vein, note the negative comments in Morrison regarding the claims by Fleischmann and Pons, of excess enthalpy in their cold fusion cells which were made to boil."

THE TRUTH - The Examiner Errs By Citing Possible Hate Crime

There are several problems with the Office's reliance upon the late Douglas Morrison. First, the criticism now cited by the Office in new argument has been addressed elsewhere (and shown to be wrong). Specifically, the *Cold Fusion Times* (pages 1, 2, 6, 8, 10-11) volume 1, issue 3 (1993) included an update by Drs. Fleischmann and Pons who have responded in great detail to said "criticism" of their work ["Response to Critique of Physics Letters A Paper", *Cold Fusion Times* (pages 1,2, 6, 8, 10-11) volume 1, issue 3 (1993)].

Second, discussion of the errors in Morrison was previously made by the Applicant with solid substantive response [A252-253,A292-A293,A323 in the Federal case] and conveniently ignored by the Examiner.

Third, Morrison, previously a serious worker in hot fusion community (CERN), deviated and then widely lectured on subjects such as unidentified flying objects (UFOs) and the Loch Ness monster. He tried to relate them to the more serious serious well-credentialled scientists in the field of cold fusion. To do so, Douglas Morrison preached his own elitist dictum based upon his "view" of science being "superior" in certain locations. Morrison implied that "good" science can only be done by a handful of "good" research institutes which are all located only in Northern Europe and the Northeastern United States. Morrison stated that other people located in Southern Europe, Asia, and Southern U.S. --and who perform research there-- are inferior scientists, who can only produce at best marginal, "bad," inconsequential, science or as he puts it "pathological" science. As proof, the following excerpt is from the Office's reference, taken from the video transcript cited by the Office.

"A disturbing pattern emerged in cold fusion experiments. Labs at high prestige universities generally got negative results. Elsewhere results were often positive." [World map is displayed with this voice-over, then Mr. Morrison speaks on camera]: 'I was absolutely astonished when I took northern Europe -- northwestern Europe. All the results were, no, no, no, no -- they couldn't find it. And when I took southern Europe it was all yes, yes, yes. And when I took eastern Europe it was all yes, yes, yes. The United States divided into two parts. If you took the major laboratories and what I call the greater region of The New York Times -- where it was read very much -- it was no, no, no. If you took the remainder of the United States -- the southern part of the United States, it was yes, yes, yes.... This rather horrified me.' "

[Morrison, 1991, cited by the Office]

This is called the Morrison "Regionalization of Results" theory [1990 "Review of Cold Fusion"]. His detractors point out that this is tantamount to "Aryan Science

"Numerology" because by whatever name for this scheme, this Aryan/Regionalization theory has nothing to do with either science or the above-entitled application, but involves elements of "hate crime". Like most elitists, Morrison did not hide his opinions. By attacking scientists' results based upon where their laboratory was located makes Morrison's -- and the Office's {since they cite him} -- prejudices quite clear. It is wrong for the Office to again endorse this, and thereby align the United States of America with such salient discrimination, hate crime, and prejudice.

Finally, the Applicant includes a letter which he once wrote to Dr. Morrison about his inaccurate report. Dr. Morrison never answered with any response or rebuttal, probably because of his inaccuracies.

The Office states,

"Later in the article it was written "Simply put, in its current state, it could provide boiling water for a cup of tea." Time delay to this working mode! - Zero years."

THE TRUTH - The Examiner Errs By Ignoring Data

Although this may be true for the art cited by Morrison, it is NOT true for the Applicant. Attached to this Response are experimental runs for Applicant's invention using this system (heavy water, codeposition, palladium, palladium) giving rise to sufficient temperatures such as Morrison requested. The temperature curves show that the water was sufficient temperature to burn a person, and that it is probably too hot for a "cup of tea". The facts speak for themselves, and the Examiner is respectfully again requested to deal with them honestly, rather than attempting to usurp Constitutional and civil rights of the Applicant.

== Errors By Examiner Regarding Murray

75. The Examiner inaccurately states:

In Ref. U2, Rich Murray raised questions about the Applicant's paper, I: Consistency of the Biphasic Nature of Excess Enthalpy in Solid State Anomalous Phenomena With the Quasi-1-Dimensional Loading Into a Material." Murray noted that for evaluation, details such as exact dimensions and locations of components of the calorimeter are needed. Murray also expressed concern about error ranges being so large."

THE TRUTH - The Examiner Errs By Relying On Netchatter

The Examiner cites a posting by Mr. Richard Murray, dated March 21, 1998. In the netpost, Mr. Murray briefly and superficially discusses the paper which the Applicant published in the peer-reviewed journal of the American Nuclear Society without evidence that he actually read the paper. We will ignore for the moment that THIS patent involves a different peer-reviewed publication [Swartz. M., 1994 "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4. "Proceedings: "Fourth International Conference on

"Cold Fusion", sponsored by EPRI and the Office of Naval Research]. In such a light of non-relevance, Murray makes manner errors and critical admissions.

First, the Examiner's attention is directed to fact that Mr. Murray is concerned about the "flawed references" in said paper. In fact, in his very critical attack on cold fusion, Mr. Murray states,

"Swartz has arrived at the scene like the enterprise, almost the only survivor."

Second, Mr. Murray's comments, however, are shallow, not very scientific, a mixed with terms like "*Borg attack*", "*Halloween*", and "*the shadow knows*". In the prism of this background, Mr. Murray's comments are those of "armchair net chatter".

Third, most importantly, the Examiner should know that the Applicant Dr. Swartz has responded to Mr. Murray and a copy of that is appended. In said response, Applicant informed Mr. Murray of the following.

"Also, in addition to references 1-7, additional nickel excess heat has been confirmed by NASA and by two separate labs at MIT where the investigators have not published their work."

For the Examiner's interest, those MIT laboratories are Lincoln and Draper Laboratories, the identity of which those that conducted said work asked the Applicant to not post the locations on the Internet.

Mr. Murray did not read the paper, and the biggest clue was his misunderstanding of the electrochemical setup, so the Applicant corrected him,

"Actually, the iron and aluminum were in alternate electrical paths in the same electrolyte. This was stated in the paper. Therefore, these were correct controls. BTW, we had tried them separately as well. We know nickel works, and iron does not. We know that platinum if exposed to nickel as the anode, can develop nickel cathodically plated out upon its surface which can apparently create some of the reaction, leading to platinum, in my experience, once used and exposed to such nickel deposition probably not being a good control unless the surface is cleaned of the plated nickel. This was also stated in the paper."

As the Examiner knows, it was also taught in the patent application filed years earlier.

Mr. Murray was not knowledgeable about thermal stratification which generates in continuum media (including possible Bernard instability), so the Applicant corrected him.

"Despite, Mr. Murray's implication, we have measured with redundant systems, and at many points within the electrolytic cells. Furthermore, we have examined various thermometric systems to get the thermometry right before the calorimetry. This was stated in the paper. Therefore this internal thermal stratification is NOT an issue. Furthermore we measured the excess (or otherwise for the other materials) heat in a multiring system, and the

subsequent rings also corrected for that issue. This was also stated in the paper."

"If Mr. Murray, or more likely a student or research of the field, would like to read further in the literature and apply some numbers, he/she might try issues of greater quantitative significance, such as discussed in Swartz, M., 1996, "Relative Impact of Thermal Stratification of the Air

"Surrounding a Calorimeter", *Journal of New Energy*, 2, 219-221 (1996). For example, the development of hydrogen over the cathode during electrolysis increases the thermal conductivity making the measured excess heat potentially a "lower limit" because the calorimetric thermal leakage increases with the generation of H₂ or D₂ in the pericathodic volume above the electrode. "

As the Examiner knows, this too was also taught in the patent application filed years earlier.

The Examiner should know that the dean of American electrochemistry, Dr. Bockris, has also responded to another of Mr. Murray's inaccurate and unscientific diatribes attacking Dr. Miley, the past Editor of *Fusion Technology*.

== Error By Examiner Regarding Neutrons

76. The Office states,

"what are the specific conditions under which said neutronpenic levels can occur?"

THE TRUTH - Neutrons Are Not Relevant To The Present Invention

The Examiner is referred to the Phuson paper by the Applicant [*"Phusons in Nuclear Reactions in Solids"*, *Fusion Technology*, 31, 228-236 (1997)]. Fusion of isotopic fuel in a material does not usually produce significant numbers of neutrons external to said material. Therefore, many of the so-called putative "negative" results do not negate anything at all because the absence of neutrons is not the evidence of the absence of fusion of isotopic fuels in a material [eg. Williams, Kreysa, Ziegler, Hajdas, Faller, Alber, and Lewis].

Furthermore, the actual generation of neutrons although unlikely is discussed in the Examiner's cited work. These positive results include Shani, who monitored stimulated neutron radiation from deuterated materials after said deuterated materials were neutron-irradiated. Also Jones. In fact there have been many reports of low level neutrons from these systems (Gozzi 92; Wolf 90; Arata (90); Menlove 90A, 90B, Takahashi 91, Scott (90); De Nino (89); Yamaguchi (90); and Mallove (see *Fire from Ice*).

== Error By Examiner Regarding NOVA

77. The Office inaccurately states,

"Applicant's attention is directed to NOVA. ... In this respect, the television show on NOVA entitled, "Confusion in a Jar", indicated that in these cold fusion experiments, it is fairly easy to get quick results which could be "interpreted" as providing evidence of "cold fusion" but that in very carefully run experiments which were rechecked, etc., such as by using several different methods and/or detectors to attempt to detect the same presumed experimental results, the end result was negative."

THE TRUTH - The Examiner Errs By Ignoring That Videos Were Submitted Several Times Rebutting NOVA

The Examiner cites the "ancient" NOVA tape. The applicant discussed the videos in the previous communication to the Examiner. Where are the Examiner's substantive responses to the previous submitted response by the Applicant? The Examiner has ignored that the Office cited the NOVA video before repeatedly, and each time the Applicant responded with three (3) videos [CBC (1993), CBC (1994); BBC (1994)] on May 26, 1997 and November 8, 1997. The Examiner should examine the three (3) videos which Applicant sent [CBC (1993), CBC (1994); BBC (1994)] to the file folder, of which this application is a Divisional. Said videos rebut the Examiner. The Applicant's videos rebut the Office's reliance and dependence upon an older less accurate video (A10-A13,A18; A197,A240,A323-325,A327-330,A339 in the previously submitted Exhibits rendered with Applicant's response). Unlike the older NOVA video, other more recent documentaries -- already supplied to the Office by the Appellant -- made by reputable production groups such as the Canadian Broadcasting Company [CBC (1993), CBC (1994)] and the British Broadcasting Company [BBC (1994)] have meticulously researched and reported the truth surrounding cold fusion. Scores of individuals in the scientific community have contributed to the latter documentaries, and by doing so declare the Office's flawed opinion on these matters to be wrong. Those references which are cited by the Examiner are not only stale, but should be handicapped by the Examiner because many are in error, and simply did not get it right. In contrast, the references supplied by the Applicant show the present state-of-the-art, including publications by those actually working in the state-of-the-art.

Given the extensive "positive" published results which confirm the generation of products (including excess enthalpy) using isotopic fuel loaded into a material, the applicant therefore respectfully requests that the Examiner reconsider the rejection.

— Error By Examiner Regarding Rousseau

78. The Examiner cites Rousseau. This new argument is very flawed. First, as before, the Office again takes selected and older and biased excerpts to attempt to prove its "point". Second, the Office confuses purported "pathological science" with now-documented "pathological skepticism". Third, the authors whom the Office cites do not describe, or respond to, or show, the invention of the present above-entitled application.

Fourth, Dagani admits that [Dagani (1992)] growing numbers of the scientific community do take seriously the "excess heat" of cold fusion [cf. Freedman (Science 4/24/92), Chandler (Boston Globe 4/17/92), Arthur C. Clarke in Discover Magazine 5/1997]. As a result, it has been reported that scientists are **"quite convinced that there is a source of heat"** [e.g. Prof. Philip Morrison as reported in Chandler] and are **"not concerned about the lack of neutrons (expected in a conventional) fusion reaction"** [e.g. Prof. Louis Smullin as reported in Freedman].

Fifth, the United States Patent Office itself has issued patents in this field, and they have been discussed by the very same authors whom the Office cites.

"A bottle no bigger than a man's fist is creating an unusual stir among power generation engineers. The bottle is filled with ordinary water and microscopic palladium coated beads. When a little electric current trickles through the bottle, several hundred times as much power starts coming out in the form of heat - that is, if one cares to believe the instruments attached to the bottle. ... Yet supporters say something is going on inside the little heat producing bottle. As with the Utah apparatus, it's claimed that the bottle produces an excess of power as it electrolyzes, or breaks down, water molecules into hydrogen and oxygen atoms. But unlike the controversial and unpredictable Utah experiments, The Patterson cell can be turned on and off seemingly at will. Several working devices built by Dr. Patterson have been made available to two teams. "This is the first time what we have a system that seems to work every time," says a nuclear chemist who consults to utilities. The cell's reliability, which would allow scientists to manipulate it, "gives us our first chance to see if this [phenomenon] involves a nuclear reaction," he explains. "Moreover, the U.S. Patent and Trademark Office, which has flatly said that cold fusion, like perpetual motion, is impossible and unpatentable, has issued a patent on the gadget.""

[Jerry E. Bishop, *The Wall Street Journal*,
January 29, 1996, underline added for emphasis]

— Errors By Examiner Regarding Silveria and Myers

79. The Examiner cites Silvera and Myers. However, they did not achieve their loading by the method described in the present original specification, and therefore does not apply. Specifically, Silvera (90) used a diamond anvil to attempt to load palladium with deuterons. Although high pressure was obtained, the reaction was monitored by neutron detectors, and neutrons are not the proper signal for these types of reactions, even

if they were achieved by the quite different system of Silvera (90). Also, Silvera may have seen a slight increase, as it is difficult to state since there were insufficient initial background levels reported (Fig 3, page 9145, Silvera (90)). Furthermore, the papers states: "The neutron detector had deviations of 0.3 counts/h from the average of 2.1 counts/h., which we did not consider to be significant (bottom column 1, page 9145, Silvera (90)).

Myers et alia (90) used a 10,000 volt ion implantation cryogenic (41 to 81 degrees Kelvin) technique to load palladium with deuterons. Although high pressure was obtained, the these were quite inhomogeneous (see figure 5, page 266, Myers (90)). The reaction was monitored for 15 hours by charged particle detectors. Such detectors may not be the proper signal for these types of reactions (Mallove, also *vide supra*), even if they were achieved by the quite different system of Myers (90). Also, Myers did see a very slight output consistent with some possible fusion reaction (see figure 1, page 264, Myers (90)) which created 300 counts per channel of tritons. Furthermore, Myers only did this for 15 hours, which is too short (confer Swartz 97E).

Silveria and Myers demonstrates the field is real, and that many would have benefited by the granting of the patent described in the original specification and claims of the above-entitled application.

== Error By Examiner Regarding Taylor

80. The Office states,

"In the Taylor et al article (co-authored by Jones), which was submitted to the Fourth International Conf. On Cold Fusion (held Dec. 1993), it is stated in regard to the detection of neutrons from their cold fusion experiments, "The results do not provide compelling evidence of neutron production" (note particularly abstract and pages 6, 7, 9, 10)."

THE TRUTH - The Examiner Errs Because Taylor And Jones Describe Neutron Emission

Actually, the Taylor article itself describes a possible evidence of neutron emission. There was a 2-sigma deviation in the sample that demonstrated tritium. That "coincidence" is acknowledged in the article, and some of the authors admit that they should have repeated that several more times. The Examiner should read the cited articles, and also confer with the Jones neutron paragraph above.

== Errors By Examiner Regarding Taubes

81. The Office states,

"The article by Taubes on pages 299-304 of the 6/15/90 issue of Science, explains why the alleged detection of tritium at Texas A & M cannot be relied on as evidence of "cold fusion" actually taking place."

THE TRUTH -

The Examiner cites Taubes. This new argument and reference to Taubes is both wrong, irrelevant, immaterial, and egregious. Taubes focuses on a few mistakes of a few individuals from 1989, and does not reflect either the science or engineering of the field in general today, or the present invention in specific. Taubes (like Huizenga) is a career-*"negativist"* to this field who makes a living off of his book. However, Taubes is a science reporter and not a scientist. Nor has he been sworn in or proven by the Office to be an expert in these matters as the Applicant has done with the Declarants to date.

First, not only did no alleged tampering take place, but the generation of detected tritium has actually been confirmed elsewhere including in US national laboratories. Furthermore, the dynamics of the tritium which did appear, could probably not have been "spiked" as discussed in Mr. Taubes' unsubstantiated allegations crafted as innuendo to which the Office refers. Both Taubes, and now the Office repeatedly and thus odiously, have impugned individuals did not deserve it.

Second, the Office's reliance on such a purported dubious incident has **NOTHING TO DO WITH** the original specification of the above-entitled application.

Third, Taubes' book has many silly errors including claims that researchers in this field do not measure electric current, or baseline levels. This is fabricated nonsense. In fact, the Figures in the original specification of the above-entitled application and the other of the Applicant's inventions and peer-reviewed publications show that any purported absence of current measurement or baseline levels is simply not true for the present invention.

Fourth, Taubes' book has been severely -- and correctly -- criticized by Miles (92A), also Miles (92B), and Hoffman (94). Also see Mallove.

== Error By Examiner Regarding Ward

82. The Examiner inaccurately states:

"In Ref. W1, an individual noted that the Applicant first made a statement that Cold fusion is real" and then later on stated that "a single experiment demonstrating excess heat is insufficient to convince, but only shows a vector for further diligent work and study. The individual then stated, "to convince me of your (i.e., Applicant's) statement, that cold fusion is real, you need to show me at least one paper reporting clear, convincing, reproduceable, unmistakable heat production."

THE TRUTH - The Examiner Errs Vy Citing Netchatter Rather Than Scientists Skilled-In-The-Art

The Examiner cites a net posting by Bill Ward on March 7, 1998. In it, Bill Ward indicates that he's interested in cold fusion but that he was disappointed that the

Applicant, Dr. Swartz, did not take time from his busy schedule, then as visiting scientist at MIT and from his patients, and from his laboratory efforts, to "spoon-feed" Mr. Ward and explain other people's published papers to him. In fact, in the Examiner's cited art, attention is directed to Mr. Cockeram who defended the Applicant, stated,

"I really don't think it is Dr. Swartz's job to pick apart a paper for you".

SOME ERRORS OF LAW DISCUSSED BY THE EXAMINER

== Error By Examiner Regarding Dash

83. The Examiner states:

"The Board decision in Ex parte Dash, 27 USPO 2d 1481 is considered pertinent here."

THE TRUTH - The Examiner Errs Because Significant Evidence Was Submitted

The Examiner has a new argument regarding the Board of Patent Appeals and Interferences in the Dash decision. The Examiner claims the Dash decision says cold fusion does not exist. Then the examiner asserts -- without proving it -- that the Dash case is the same as the present instant case. However, there are several misstatements and logical errors in this new argument.

First, the decision states [Ex parte Dash No.92-3536 (Decided November 24, 1992 Released May 11, 1993)]: "applicants failed to produce any evidence to overcome examiner's position." [U.S. PTO Board of Patent Appeals & Interferences; Ex parte Dash No. 92-3536 November 24, 1992] **That is not the case here.** More than three hundred references, the supplied Declarations, and the Applicant's published reports in peer-reviewed journals, overcome the Examiner's position, not just because of the quantity of references, but because of the quality. **The Declarations alone overcome the Examiner's position if the Examiner actually obeyed the law and the Office's rules.**

Second, the present invention is neither described by, nor referred to, within Dash, or said Appeal Decision. Dash is simply a different case despite the Office's new argument. As such, the use of the Dash decision is improper.

== Error By Examiner Regarding In re Chilowsky,

84. The Examiner inaccurately states:

"The present case is considered analogous to that in In re Chilowsky ... wherein the court held the disclosure to be insufficient. In the present case (despite Applicant's arguments to the contrary), the examiner has shown that various necessary parameters have not been provided and, the examiner has provided evidence that the artisan does not know the requisite parameters of an operative cold fusion system, nor how to make and use an operative cold fusion system."

THE TRUTH - The Examiner Errs By Ignoring The Original Specification

The Examiner is disingenuous. The amount of evidence required for proof of utility depends on the facts of each individual case [In re Gazave, 54 CCPA 1524, 379 F.2d 973, 154 USPQ 92 (1967); In re Chilowsky, 43 CCPA 775, 229 F.2d 457, 108 USPQ 321 (1956); In re Jolles, U.S.C.P.A., 1980, 628 F.2d 1322, 206 USPQ 885]. Applicant has provided the Office with those parameters, and previously in a case before the US Supreme Court, the Office was caught being dishonest about voltage, temperature, and other parameters. A copy of that is included with this response so that the Examiner and the Court if necessary can see that this disingenuity is systematic. Applicants data and sterling references consisting of scores of articles taken from peer-reviewed and other scientific and educational journals, all in rebuttal to the Office's misstatements. Appellant's references have been listed on Forms PTO-1449 with the appropriate Petition pursuant to 37 CFR 1.97(d)(1)(ii), and certificate pursuant to 37CFR 1.97(d)(1)(e), appended. Said references, like the submitted unrebutted Declarations are relevant and overcome the opinions of Examiner because of the reasons stated in said Appeal and Reply Briefs.

== Error By Examiner Regarding Italy - Court

85. The Examiner inaccurately states:

"It is also noted that there has apparently been a court decision on cold fusion in Italy ... "

THE TRUTH - The Examiner Errs And Cites A Libel Case

The cited case is irrelevant, immaterial, and was a libel case and did not involve the case for cold fusion, nor the case for the present invention.

SUMMARY

86. It is commonsense that the individuals in the scientific community who actually attend the Conferences in cold fusion are the same ones who evaluate its products and publications. This community as defined by the rules of the Office and by commonsense -- if it will be applied in this case -- verify the existence of the field. Publications show that growing numbers of the scientific community consider the positive results of cold fusion as being confirmed. Where is the Examiner's comment on any one which proves the statements of the Examiner are disingenuous. Said publications continue to this day, including (and each of which show the Office's opinion is flawed):

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Will, Fritz G., Krystyna Cedzynska, Denton C. Linton, Tritium Generation In Palladium Cathodes With High Deuterium Loading, Transactions Of Fusion Technology, Vol. 26, Number 4T, Part 2, December 1994: P. 209.

Where is the Examiner's response technically? Are all these people lying as the Examiner and Office purport? No. In fact, such widespread replications of cold fusion, and other developments in the field, have more evidentiary value then the few flawed "negative" reports cited by the Examiner. The facts dispute the erroneous rejection of all pending claims made by the Examiner pursuant to 35 U.S.C. 112, first paragraph, based upon the Examiner's incorrect -- and unfounded given the supplied Declarations -- opinion that the "environment" in which the above-entitled invention operates "does not exist". In contrast to the few "nay-sayers" the Office cites, and in contrast to the "older" books, papers, and newspapers to which the Office refers in its new argument, stand the facts and the Declarations which demonstrate the existence of these reactions, and even their generation of nuclear fusion products (such as helium-4), and the operability of the present invention. The positive results, the Declarations, and the peer-reviewed published literature [including Swartz. M., 1994 "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4. "Proceedings: "Fourth International Conference on Cold Fusion", sponsored by EPRI and the Office of Naval Research] have much more evidentiary value then the few "negative" less credible -- recycled and older -- reports cited by the Examiner. Therefore. the subject matter sought to be patented as defined by the pending claims have operability, and resides in a field which does exist and have utility.

EXAMINER'S ERRORS REGARDING CRITICAL FEATURES OF THE PRESENT INVENTION

87. The Examiner states again the following, ignoring the entire detailed comprehensive response of the Applicant and the original specification and claims:

"...this "something additional", this critical feature, must be clearly specified so as to enable the artisan to make and use the invention as required by statute."

THE TRUTH - Critical Features Were Specified And Claimed And Discussed Previously

The Examiner is disingenuous in the matter of a "critical feature" because the applicant has already diligently supplied information of several critical features which were taught in the original specification of the above-entitled application several times. These were fully discussed in the previous communication from the applicant to the Examiner, dated 12/3/02. The nature of the invention, along with introduction of some of the Declarations, was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, on page 11 and 12. The operability of this invention was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, including on pages 57 though 85. The role of loading in the operability of this invention was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, on pages 57-58. The role of the optimal operating point in the operability of this invention was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, on pages 59-60 and 66. The equations associated with the loading, and the catastrophic behavior of the loaded isotopic fuel, was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, on pages 61 through 65, and 70-71. Applicant's extensive publications, and supporting publications, was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, on pages 72-74. Where is the Examiner's substantive response to most or all of this? The Examiner has ignored many of the Applicant's detailed Arguments.

Where are the Examiner's responses to these submitted responses by the applicant?

TO REVIEW AND SUMMARIZE AGAIN:

There are several differences including, without minimizing any of the others not cited:

- 1) Loading control through methods taught in the above-entitled application,
- 2) Control of Loading Flux,
- 3) Optimal Operating Points, and
- 4) Two stage catastrophic movement of loaded hydrogen within the metal

These were discussed in the application, in the cited other applications, the cited published papers, and further in the previous responses to the Examiner (which has been ignored in this respect to a serious degree perhaps inadvertently or unintentionally).

The two-stage nature of the present invention was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, including on pages 67-68. Where is the Examiner's substantive response?

REQUISITE LOADING [#1 IN PATTERNS OF FAILURE]

88. The Examiner states:

"There is neither an adequate description not enabling disclosure of the parameters of a specific operative embodiment of the invention"

"There is neither an adequate description ... minimum concentration of the isotopic fuel in the cathode necessary for the desired reactions to take place, "

THE TRUTH - Loading, The Critical Feature, Here Was Discussed Previously

The role of loading in the operability of this invention was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, on pages 57-58. Where is the Examiner's response to Figure 1 therein, also in Applicant's peer-reviewed publication, including Swartz. M., 1994 "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4. "Proceedings: "Fourth International Conference on Cold Fusion"? There is none. Instead, ignoring it, the Examiner inaccurately states there is no disclosure. However, this, and the isotope ratios in the metal and loading, were discussed in the original specification [S.N. 07/760,970, confer also Swartz (97C)], and in the referred to Applications (for example '457 on page 16, lines 11-14), and in reference to the peer-reviewed articles [Swartz (1992), Swartz (1993), Swartz (1994)].

The invention at issue in this case, generally speaking, uses a metal such as palladium which has the unique property of internally filling ("loading") with hydrogen, as a sponge fills with water. Loading of a material (palladium) with a hydrogen is neither unproven "theory" nor "incredible" as the Examiner falsely writes, but can be elicited using the teachings of Applicant's other specifications and claims, as cited. Applicant taught how to introduce fuel ["load"] as claimed. As Dr. Scott Chubb stated about the patent application of which this Application is a divisional, in his Amicus Brief,

"...each deuterium nucleus (D) may effectively dissociate from its electron and freely flow through the metallic substrate ... these nuclei ... are free to move throughout a crystal lattice"

Applicant has discussed loading in considerable detail in several cases before the Office, and these were even understood by the Federal Appellate Court. Applicant did refer to said applications and cases in the present application. Loading is discussed in each of the referred to patent applications of the Applicant, including '457 where it is discussed on page 16, lines 11-14. [Specifically, in the '970 application, Applicant taught

about loading on pages OS 15-16, 19, 20, 21, 22, 24, 27, 28, and 34 in the original specification.] Applicant's loading technology, consistent with conventional physics, has been published in peer-reviewed journals [Swartz, M., Fusion Technology, 22, 2, 296-300, 1992; 26, 4T, 74-77, 1994; 32, 126-130, 1997; Hagelstein, Swartz, MIT RLE Progress Report, 139: 1, 1-13 (1997); Swartz, Fusion Technology, 31, 228-236 (1997); ICCF-4, (1994); J.New Energy, 1,4,26 (1997); M.Swartz, 1992, "Quasi-One-Dimensional Model of Electrochemical Loading of Isotopic Fuel into a Metal", Fusion Technology, 22, 2, 296-300; Swartz, M., 1994, "Isotopic Fuel Loading Coupled To Reactions At An Electrode", Fusion Technology, 96, 4T, 74-77; "Codeposition Of Palladium And Deuterium", Fusion Technology, 32. 126-130 (1997); Swartz, 1994, "Generalized Isotopic Fuel Loading Equations", and "Cold Fusion Source Book", International Symposium On Cold Fusion And Advanced Energy Systems", Ed. H.Fox, Minsk, Belarus; Swartz, 1997]. These are proof and confirmation of Applicant's teachings and demonstrate and confirm enablement of those teachings, and relevant here, also demonstrates confirmation of the teachings taught years earlier in the original specification and claims of which the present application is a divisional. Furthermore, Figure 1 did show the increase in observed excess enthalpy (or heat, shown along vertical axis) from a palladium (Pd) electrode loaded with deuterons (D) from heavy water. Increased loading is towards the right hand side. Attention is directed not only to the fact that the desired reactions are zero below ~0.85.

2) Control of Loading Flux, 3) Optimal Operating Points

The Examiner inaccurately purports that the description of means to "charge the palladium with deuterons" was inadequate, and that the specification (which does refer to other pending applications) was not unique. This notion is utterly incorrect for several reasons. Applicant cites his publications and other applications. In '457 Applicant taught "increasing through a series of at least three incremental steps the electric power drive conditions of said electrical circuit" on page 15, lines 15-20, and page 23, lines 14-17. Furthermore, in '457 and in the corresponding figures in Swartz(97), there are graphs of the output [Figure 6, labels 701, 702] and the V-I (voltage current) characteristics [Figure 5, labels 503, 510, 519, 520, 504, 521]. Many "negative" results the result of the failure to operate the system at the optimal operating point, as shown in Figure 2 from the Applicant's peer-reviewed published paper. Furthermore, in addition, to alleviate any possible additional problem which the Examiner might have, the Applicant has now amended this application to include again said references to said other applications, and to said peer-reviewed published papers.

In addition to loading, "optimal operating points" must be understood to successfully use LENR/CF systems. This graph shows the biphasic response of the products (heat,

helium-4, tritium) of these systems to increasing input electrical driving power. The horizontal axis represents the electrical input power and is logarithmic. The nickel light water data is from Swartz; the palladium heavy water data are from Miles (USN) and Szpak (USN). The data reveal relatively narrow loci of optimal operating points. Driving with electrical input power beyond the peaks (optimal operating points) does not help the production of the desired product but yields a falloff with increasing input power. Optimal operating points account for some of the widespread difficulties in observing these phenomena because of driving the systems inadvertently or unintentionally outside of the optimal operating point (Swartz. M., *Journal New Energy*, 4, 2, 218-228 (1999), Swartz. M., *Transactions of the American Nuclear Association*, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85); Swartz. M., G. Verner, A. Frank, H. Fox, *Journal of New Energy*, 4, 2, 215-217 (1999); Swartz. M., 1997, *Fusion Technology*, 31, 63-74).

The nature of the invention, along with introduction of some of the Declarations, was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, on page 11 and 12. The role of the optimal operating point in the operability of this invention was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, on pages 59-60 and 66. Where is the Examiner's substantive response?

4) Two-stage catastrophic movement of loaded hydrogen within the metal

The system is designed to enable the generation of a catastrophic desaturation. In the present case, the palladium is saturated, fully loaded, with isotopic fuel, and then the catastrophic condition is created. The office purports inadequate enablement of "catastrophic desaturation", and that it is indefinite. In fact, contradicting the Examiner, the applicant's peer-reviewed publications about catastrophic desaturation have been published by EPRI, the U.S. Navy, the American Nuclear Society. Applicant's publications have taught internal diffusion flux of isotopic fuel (hydrogen) as discussed in peer-reviewed journals [Hagelstein, Swartz, Optics and Quantum Electronics, *MIT RLE Progress Report*, 139: 1, 1-13 (1997); Swartz, 1997, "Phusons in Nuclear Reactions in Solids", *Fusion Technology*, 31, 228-236 (1997); Swartz, 1994, "Catastrophic Active Medium Hypothesis of Cold Fusion", 4, "Proceedings: *Fourth International Conference on Cold Fusion*" sponsored by EPRI and the Office of Naval Research; Swartz, 1997, "Hydrogen Redistribution By Catastrophic Desorption In Select Transition Metals", *Journal of New Energy*, 1, 4, 26-33]. This is confirmation of Applicant's teachings of internal diffusion isotopic fuel and interstitial barriers. Importantly, these teachings confirm operability as taught years earlier in the original specification and claims.

The Applicant notes that these papers --involving catastrophic desaturation-- underwent peer-review and were published. Furthermore, those who are skilled-in-the-art

have agreed that said catastrophic desaturation is a critical issue for the successful performance of the system [Swartz (94B), Swartz (97B)]. The present invention is a divisional of S.N. 07/760,970 ("the '970 application"), a two-stage method to control loading. In the original disclosure of which the present application is a divisional, catastrophic desaturation was presented in several figures and discussed, including the use of pressure, temperature, or other means to generate said catastrophic desaturation. Applicant taught about generating movements of isotopic fuel in the loaded metal ["flux"] on pages OS 15-16, 19, 20, 21, 22, 24, 27, 28, and 34 in the original specification of which this present application is a divisional.

"The fusion reaction is driven by the catastrophic fractional desaturation of deuterons from the crystalline palladium lattice, previously filled to capacity."
[07/760,970; Original Specification, page 21-22]

S.N.07/760,970 [now as Continuation in this application] involves a two-stage process involving loading of hydrogen into a metal electrode such as palladium. Applicant taught using a first stage of electrode loading, followed by, a second stage of sudden rapid ("catastrophic") flow of the loaded hydrogen within the metal. Applicant taught in the original specification and claims how this apparatus works and presented objective detailed evidence of the invention. The first stage is the electrode loading, and then, in the second stage a rapid ("catastrophic") flow of hydrogen results within the metal. After the initial loading, said flow (or flux) of hydrogen takes place (pages 15-16, 19-22, 28, 33-34; S.N.07/760,970) until the previously-loaded palladium is spent of its deuterons or the material is otherwise damaged.

The two-stage nature of the present invention was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, including on pages 67-68. Where is the Examiner's substantive response? The Examiner has ignored many of the Applicant's detailed Arguments.

89. The Examiner states,

Accordingly, all of the issues set forth in said previous Office action regarding lack of enablement are still pertinent in determining the patentability of Applicant's claims. Specifically, the following items were not addressed in the applicant's amendment are now repeated (in bold! letters):

THE TRUTH - The Examiner Is Disingenuous

The Examiner has made a deliberate false statement. The Applicant respectfully requests and reason for this vast departure from the normal standards of review. Much of the following was previously discussed in the recent communication from the applicant to the examiner, dated 12/3/02. There was a certificate of mailing on page 95 therein. The equations associated with the loading, and the catastrophic behavior of the loaded isotopic fuel, was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, on pages 61 through 65, and 70-71. The material was in the original specification and claims, is known to those skilled-in-the-art, and was addressed previously. Where is the Examiner's substantive response? The Examiner has again elected to ignore many of the Applicant's detailed Arguments.

90. The Examiner states again, ignoring the entire response and original specification of the Applicant.

"There is neither a written description nor an enabling disclosure as to how and in what manner so-called "distribution" is achieved."

THE TRUTH - Critical Features Were Specified And Claimed And Discussed Previously

The Examiner is disingenuous. These were described in the original specification through the use of an applied electric field intensity. As fully taught in the disclosure, and the patents which are referred to, the power source generates the applied electric field intensity. The induced drift by the applied electric field is shown schematically in the figure which does not mean that the deuterons travel in such a simple fashion. The electric field distribution is altered as the solution and system each respond with complex conduction and polarization phenomena. Ionic drift, secondary space charge polarization, propagation of solvated deuterons, deuterons in clathrates, and L-,D-deuteron defects with their ferroelectric inscription in the heavy water, and the formation low dielectric constant bubbles abutting the cathode are the minimum expected. The double layer between the solution and the metal is created both by the cathode fall of ions and other polarization reactions. The mechanisms of dielectric polarization and conduction have been cited in the submitted applications by the applicant which are referred to in the present application. If any are omitted they are now added to this disclosure, to supplement the others. The Examiner is again referred to the following on electrochemistry and continuum electrodynamics, sine qua non to those skilled in the art [Uhlig, H.H., "Corrosion and Corrosion Control", Wiley (1971), Bockris, J., K.N. Reddy, "Modern Electrochemistry", Plenum Press (1970), Von Hippel, A. "Dielectric Materials and Applications", MIT Press, (1954); Von Hippel, A., D.B. Knoll, W.B. Westphal,

"Transfer Of Protons Through 'Pure' ICE Ih Single Crystals", J. Chem. Phys., 54, 134, (also 145), (1971), Melcher, J.R., "Continuum Electromechanics", MIT Press, Cambridge, (1981), also "Electromechanical Dynamics", Part III, Elastic and Fluid Media, H. Woodson, J. Melcher, J. Wiley & Sons, Inc., NY (1968)].

91. The Examiner states,

"On page 11, lines 9+, an equation is given for the spatial distribution of deuterons, $D^+(z)$. However, there is neither an adequate description nor enabling disclosure of how in what manner this distribution was derived from the molecular flux, $F(D^+)$. .. The disclosure is insufficient as to which parameters on the right hand f side of the $D^+(z)$ equation are spatially dependent."

THE TRUTH - Equations Were Discussed

The Examiner has made a deliberate -- repeated -- false statement. The equations associated with the loading, and the catastrophic behavior of the loaded isotopic fuel, was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, on pages 61 through 65, and 70-71.

The Applicant has explained this before to the Examiner, and his disingenuous comment is made in the face an adequate description and an enabling disclosure of how the distribution is derived by an applied electric field. Furthermore, this is well known to those skilled in the art, and in addition, the applicant gave the Examiner references.

The applicant did state what terms on the right hand side are spatially dependent. Furthermore, is another example where the Examiner remains vicious in his attack against the applicant, rather than complying with the standards of review.

The parameters which the Examiner is having trouble understanding are well known in the field.

Those skilled in the art understand that the applied electric field influences the spatial distribution of deuterons in aqueous solution. Without significant convection, the flux (J_i) of any i th species (here deuterons) results from diffusion down concentration gradients and electrophoretic drift.

$$J_D = -B_D * \frac{d[D(z,t)]}{dz} - \mu_D * [D(z,t)] * \frac{d\Phi}{dz} \quad (\text{eq.1})$$

For additional background, the Office is referred to Swartz, M., "Quasi-One-Dimensional Model Of Electrochemical Loading Of Isotopic Fuel Into A Metal", Fusion Technology, 296-300 (1992) Swartz, M., "Isotopic Fuel Loading Coupled To Reactions At An Electrode", ICCF-4 (1993); Swartz 97C, 97B. These equations are complex because they include the differential isotope diffusivity, electrophoretic mobility, solubilities and the range of susceptibilities of the

materials and products involved, which have parameters and vary with temperature. Applicant's writings, including the original specifications filed with the Patent Office go on with how the results of the mathematical expression concerning the deuteron flux into palladium relates to the applied electric field intensity.

The equation is the first of the quasi-1-dimensional model of loading which offers insight into the processes because it indicates how both competitive gas evolving reactions at the metal electrode surface and the ratio of the applied electric field energy to thermal energy [k_B*T] are decisive in controlling the loading of the metal by the deuterium.

The equation can be examined for its relation to thermal processes by substitution using additional non-dimensional parameters and the Einstein relation.

$$\frac{B_D}{\mu_D} = \frac{k_B*T}{q} \quad (\text{eq.2})$$

Coupled equations thus determine the distribution of deuteron species in the bulk solution. The mathematical solutions are determined both by the boundary conditions and by conservation of mass. The Q1D model indicates that the deuteron loading rate into the electrode is critically linked to gas evolution and is also first order on $\mu_D * E$. This loading rate equation (equation 3) relates deuteron availability (secondary to the applied electric field) to the losses of deuterons to both gas evolution and the fusion reactions.

$$\kappa_e = (\mu_D * E) - (\kappa_g + \kappa_{fus}) \quad (\text{equation 3})$$

One simple but important corollary is that the evolution of D2 gas and deuteron loading to the palladium cathode are mutually exclusive for any given applied electric field. Another important corollary is that this NOT ELECTROLYSIS. As Applicant taught in Swartz(92), and Swartz (89), electrolysis is the opposite of what is desired. This is yet another difference from all other cited art.

SUMMARY:

92/ The correct dimensional analysis begins with the equation describing the quasi-1-dimensional model of loading. This offers insight into the processes because it indicates how both competitive gas evolving reactions at the metal electrode surface and the ratio of the applied electric field energy to thermal energy [k_B*T] are decisive in controlling the loading of the metal by the deuterium. As Applicant taught, the loading flux [of the isotope of hydrogen into the cathode], must be distinguished both from the gas evolving flux, and even from the total current, as well (Swartz 1992).

"The three additional components of deuteron flux must be considered. The first is the entry of deuterons into the bulk of palladium which constituted the cathode. That flux is described as J_e , the rate at which deuterons physically enter the palladium cathode. The second deuteron flux is that component lost at the cathode to gas evolution ... (J_g)... J_f is the the flux of deuterons lost to fusion."

[Swartz, M., Quasi-One-Dimensional Model Of Electrochemical Loading Of Isotopic Fuel Into A Metal, *Fusion Technology*, 296-300 (1992)]

The loading flux [of the isotope of hydrogen into the bulk volume of the palladium cathode] is fundamental to the entire understanding of these phenomena, and it was explicitly taught in the original specification. The loading flux must also be distinguished both from the gas evolving flux, and even from the total current, as well.

93. The Examiner states,

"The disclosure is insufficient as to what exactly are the approximations made to arrive at $D^+(z)$, in addition to the disclosed approximation of no free charge density."

THE TRUTH - A Physicist would not ask this non-scientific question

The Examiner has made another deliberate false statement. Given this, and the Examiner's purporting that voltages yield magnetic fields (vide infra), there is heralded the Examiner's lack of knowledge of physics by claiming that there is free charge density. To those in the field of electric physics, electrical engineering, and physics, the Examiner statements are false. Furthermore the applicant to explicitly made statements as to what the approximations were. The Examiner is disingenuous again, because his comment is falsely made in the face of this material in the original specification, and the papers referred to therein.

94. The Examiner states,

"For example, The disclosure is insufficient as to how and what losses, if any, are exactly accounted for in the equations (e.g., loss due to deuteron gas evolution from the bulk solution)."

THE TRUTH - The Examiner Is Disingenuous

The Examiner has made another deliberate false statement. This disingenuous comment is made in the face of a full description of the terms in the equation involved with gas evolution. Furthermore the Examiner was led to the applicant's peer reviewed published paper in *Fusion Technology*. The equations associated with the loading were discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, on pages 61 through 65, and 70-71. [also from page 57 to the cited pages].

Where is the Examiner's substantive response? The Examiner has ignored many of the Applicant's detailed Arguments and then merely repeated the questions - over and over. THAT IS HARASSMENT.

Even if the applicant did not explicitly state what the terms are, and the applicant did, this is well known to those skilled in the art, and in addition, the applicant gave the Examiner references. The loading flux [of the isotope of hydrogen into the bulk volume of the palladium cathode] is fundamental to the entire understanding of these phenomena, and it was explicitly taught in the original specification. The loading flux must also be distinguished both from the gas evolving flux, and even from the total current, as well. For additional background, the Office is referred to Swartz, M., "Quasi-One-Dimensional Model Of Electrochemical Loading Of Isotopic Fuel Into A Metal", Fusion Technology, 296-300 (1992) Swartz, M., "Isotopic Fuel Loading Coupled To Reactions At An Electrode", ICCF-4 (1993); Swartz 97C, 97B. These equations are complex because they include the differential isotope diffusivity, electrophoretic mobility, solubilities and the range of susceptibilities of the materials and products involved, which have parameters and vary with temperature. Applicants writings, including the original specifications filed with the Patent Office go on with how the results of the mathematical expression concerning the deuteron flux into palladium relates to the applied electric field intensity.

95. The Examiner states,

"On page 16, lines 6+, the applicant discloses an equation for the deuterium partial pressure, PD2. However, the disclosure is insufficient as to what exactly are the terms a and "n"."

"On page 18, lines 12+, the applicant discloses an equation for the fractional saturation, YD. However, the disclosure is insufficient as to what exactly is the term C1."

THE TRUTH -Terms Understood by Those Skilled-in-the-Art

With all due respect, these terms were discussed. Background from the Examiner on fugacity against includes Uhlig, H.H., "Corrosion and Corrosion Control", Wiley (1971) and Bockris, O'm, J., K.N. Reddy, "Modern Electrochemistry", Plenum Press (1970), especially Bockris. Again, the Examiner is incorrect because pressure range is discussed in the original specification of '970, and in the referred-to Application ('457) with reference to number 132 in Figure 3, on page 17, lines 18-22, therein, and in the other peer-reviewed publications cited above. C1 is a constant of proportionality, as discussed in the original specification.

96. The Examiner states:

"There is neither an adequate description ... surface area-to-volume requirement for the reactor"

THE TRUTH - The Examiner Leads Away From This Invention

The Examiner inaccurately states there is no disclosure of "surface area-to-volume requirement for the reactor". However, this is inaccurate because the relevant issues of temperature, mass, and thermal capacity, fraction saturation, etc. which were discussed in the original specification. If the Examiner feels that his notion defeats conventional electrophysics and solid state physics and nuclear physics, then perhaps he should state with specificity his question and the reason for it, rather than just "brick-toss" words which are not consistent with electrical engineering practice.

97. The Examiner states:

"There is neither an adequate description ... the exact composition (including impurities and amounts thereof) of the electrolyte and of the cathode and of the anode"

"There is neither an adequate description ... atomic or weight ratio of metal electrodes to electrolyte (e.g. palladium to gel)".

THE TRUTH - Composition Was Discussed Previously

The issues of gel were addressed in another and were answered before in the previous communication. Where is the Examiner's response to Applicant's description of composition of electrodes and solution? Swartz (07/339,976; filed April 18, 1989, a specification pending before the Patent Office) and Swartz (07/371,937; filed June 27, 1989, specifications pending before the Patent Office, now as a Continuation) taught codeposition of palladium salts.

"the combination of palladium salts ... and the means to cathodically codeposit said materials directly onto a cathode.

[Swartz; US 07/39,976; April 18, 1989]

The parent of the above-entitled application goes even further and teaches the use of gels and other strategically configured systems, and the present application discusses the advantages of a dissolving palladium anode.

The issue of loading is known to those with a science education in the United States. Most importantly, the isotope ratios in the metal and loading, were discussed in the original specification [S.N. 07/760,970, continued as S.N. 09/750,765; confer also Swartz (97C)], and in the referred to Applications (for example '457 on page 16, lines 11-14), and in reference to the peer-reviewed articles [Swartz (1992), Swartz (1993), Swartz (1994)].

98. The Examiner states:

"There is neither an adequate description ... voltage and current requirements to produce the magnetic field"

THE TRUTH - "Voltage ... To Produce Magnetic Field" Heralds Examiner's Lack Of A Serious Physics Education

The Examiner asks for the "voltage .. requirements to produce the magnetic field". No one who says this was a deserved graduate of any qualified science or engineering institution. Any individual from a 7 year old seeking an amateur radio license, to any high school graduate, to certainly any engineer or physicist, would KNOW Ampere's Law. The line integral of the magnetic field intensity around a line electrical current is related to that current. Not voltage. The Examiner's statement finally reveals him to have no interest in the Applicant's invention, but only to savage and harass the Applicant with non-scientific chatter. The Applicant hereby requests from the Examiner --or the Commissioner for Patent-- to explain the above statement by the Examiner. The Applicant --and truth, justice and the American way-- challenge the Office, Examiner and Commissioner, to name some inventions in the Office's history which violate Ampere's law. Applicant, who has four electrical engineering degrees from MIT (BS, MS, EE '71) and ScD '84 requests that the Examiner and Commissioner explain the latest demand and demonstrate a basis for physics and science competence by the Examiner and his supervisors.

Furthermore, this AGAIN PROVES that the Examiner has no interest in the Applicant's invention..

99. The Examiner states:

"These impurities can have an adverse effect on the desired operation of the invention."

THE TRUTH - Examiner's Systematic Fixation On Contamination Suggests Psychopathology

Contamination was discussed in the previous communication from the applicant to the examiner, dated 12/3/02 and in many of the other applications, including '457. The Examiner should read the books which the Applicant suggested previously regarding this because they are well-known to those familiar with the state-of-the-art. The applied electric field is direct to move cations (i.e. Pd^{++}) to the cathode where it plates out. The Examiner was referred to the following on electrochemistry and continuum electrodynamics, *sine qua non* to those skilled in the art [Uhlig, H.H., "Corrosion and Corrosion Control", Wiley (1971), Bockris, J., K.N. Reddy, "Modern Electrochemistry", Plenum Press (1970), Von Hippel, A. "Dielectric Materials and Applications", MIT Press, (1954); Von Hippel, A., D.B. Knoll, W.B. Westphal, "Transfer Of Protons Through 'Pure' Ice Ih Single Crystals", J. Chem. Phys., 54, 134, (also 145), (1971), and Melcher, J.R., "Continuum Electromechanics", MIT Press, Cambridge, (1981)].

100. The Examiner states:

"In the current application the Applicant does not define the products of the claimed process and apparatus....the only possible "products" that can be formed in the claimed invention are nuclear fusion products. "

"The generation of excess heat has been known in the art as "cold fusion". Clearly, the "products of the current claimed invention must be the same as the product of "cold fusion""

THE TRUTH - Products Including Loading, Heat and Helium-4 ARE Defined

This was discussed in the previous Communication with the Examiner on page 69. Where is the Examiner's response? Instead, the Examiner, inadvertently or unintentionally appears to just ask the same question. It is unfair for the Examiner to change "loading" to "cold fusion" and it is unfair for the Examiner to change "heat" to "excess heat", but that is consistent with the Office's systematic attempt to usurp the Applicant's Constitutional and civil rights.

With all due respect to the Examiner's comments, the original specification of the above entitled application did in fact cite heat as a product of the desired reactions. The present application concerns loading, and is generally speaking a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal and means to extract product using magnetic field inhomogeneity, based differential magnetic susceptibilities. Heat is discussed as a product. In contrast, neutrons were not discussed because their production is vanishingly small, to the degree that exists at all for reasons discussed in the Applicant's published paper [Swartz, 1997, "Phusons in Nuclear Reactions in Solids", *Fusion Technology*, 31, 228-236 (1997)].

101. The Examiner states,

On page 25, lines 7+, the applicant discloses a cluster of seven CAM devices that is supported and thermally coupled by epoxy. However, there is neither an adequate description nor enabling disclosure of how and in what manner epoxy can so maintain the devices in a stacked configuration (i.e., not fall apart), especially during the period when the alleged astronomical pressures are developed.

THE TRUTH - The Examiner Discusses Fugacity Which Was Discussed And Ignored By The Examiner

The Examiner has made another deliberate false statement. This was discussed in the previous Communication with the Examiner on page 71. Where is the Examiner's response? With all due respect, fugacity is a calculated pressure within an electrochemically used electrode. Background from the Examiner on fugacity against includes Uhlig, H.H., "Corrosion and Corrosion Control", Wiley (1971) and Bockris, O'm, J., K.N. Reddy, "Modern Electrochemistry", Plenum Press (1970), especially Bockris. Again, the Examiner is incorrect because pressure range is discussed in the original specification of '970.

102. The Examiner states,

On page 32, lines 4+, the applicant discloses that the products are removed at the product barrier. However, there is neither an adequate description nor enabling disclosure of how and in what manner said products are so removed.

THE TRUTH - The Description using an Inhomogeneous Magnetic Field WAS Given

The Examiner has made another deliberate false statement. As specified in the original disclosure: The pumping action upon products [other than heat] is from the action of an applied force exerted upon said product (in this case an isotope of hydrogen: tritium). The generation, and calculation, of the force induced by an applied magnetic field intensity upon the desired isotope which is generated within the CAM reactor, is derived as follows.

"An inhomogenous magnetic field intensity is applied by coil labelled 300 to one portion of the cathode (1). Said magnetic field is driven by the power supply (labelled 301) in the figure. The spatially inhomogenous magnetic field could also be created by a superconductor."

[07/760,970; the present application in Continuation; Underline added for emphasis]

Ampere's Law is used to calculate the line integral of the magnetic field intensity around the applied electric current. That magnetic field intensity exists mainly in the gap between the high permeability rod (around which the coil has been wound) and includes the volumes encompassing the desired isotope [cf. Figure 18 of the original specification].

"The differential magnetic susceptibility between isotopic fuel and the nuclear fusion product is used to magnetically pump the product to and through the barrier labelled 350. At that location there is a buildup of the

isotope with the larger magnetic susceptibility due to said differential magnetic susceptibility."

[07/760,970; the present application in Continuation]

103. The magnetic field intensity can be derived by inspection in the gap region based upon Gauss' Law, which implies that the divergence of the magnetic flux density is zero. Therefore, the use of a volume with one surface abutting the volume containing the desired isotope and the other surface abutting the end of said rod, results in a ratio between the two magnetic fields.

The magnetic field as taught in the above-entitled application is spatially inhomogeneous. The original specification and claims of the present invention also taught and claimed a separation system to extract an precise product - another feature of great utility.

A magnetic field inhomogeneity, based upon the differential magnetic susceptibilities [cf. Swartz and Declarations; A10-A21], creates forces which make this a **"non-linear device in the sense that the containment field distribution is spatially non-uniform. ... the ... invention is therefore a chemical collection device."**

[Straus Declaration 1994]

104. The magnetic force, resulting from the applied magnetic field, is the spatial derivative of the magnetic coenergy with respect to distance.

"The magnetic force resulting from the applied magnetic field is the derivative of the magnetic coenergy with respect to distance in the axial direction, and is proportional to the square of the current, the square of the number of turns in the coil (300), and said differential magnetic susceptibility. The products are removed at the product barrier (labelled 350). If said isotopic product is of lower magnetic susceptibility, then the coil is moved toward the portion of the cathode near to the solution (6)."

[07/760,970; the present application in Continuation]

As an alternative means of calculating the applied magnetic force upon the desired isotope is to use the Maxwell Stress Tensor. The Maxwell Stress Tensor is based upon the orthogonal, and parallel, components of the magnetic field intensity over the surface of the desired isotope. The stress tensor is quite complex. The calculated force is based upon the spatial divergence of the stress tensor. Both methods of deriving the magnetic force are identical

105. These solutions are extremely complex but an introduction to this physics in a far simpler system [as regards ferrofluids and not the more complicated invention and products of the above-entitled application] is available in "*Electromechanical Dynamics*",

Part III, Elastic and Fluid Media, H. Woodson, J. Melcher, J. Wiley & Sons, Inc., NY (1968), pages 772 to 777 [cf. figures 12.2.21 and 12.2.24].

The important result, as stated in the original specification, is that energy of the entire system decreases by the movement of the higher susceptibility isotopes towards, and into, the region containing the greatest magnetic field intensity.

The Examiner ignores *In re Brana* and *In re Eltgroth*, 419 F.2d 918, 164 USPQ 221 (CCPA 1970) which demand that the Examiner must establish a reason to doubt an invention's asserted utility, and the loading of an isotopic fuel into a material by an applied electric field, using a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal and means to extract product using magnetic field inhomogeneity, based differential magnetic susceptibilities [cf. Swartz and Straus Declarations] is not 'incredible' or 'unbelievable' like the Examiner appears to purport. This invention is quite believable.

106. The Examiner states:

"There is neither an adequate description ... dimensional ratio of electrodes to their spacing size"

"There is neither an adequate description ... sizes of anode and cathode relative to the space between them"

"There is neither an adequate description nor enabling disclosure of how and in what manner the said three devices are so held in place by clips. Also, there is neither an adequate description nor enabling disclosure of how and in what manner the said three devices can be inserted into the receptor apparatus while they are clipped to the board. The applicant also states that some clips are electrically conductive and some are insulators. The disclosure is insufficient as to which components exactly receive the conductive clips and which components get the insulator."

THE TRUTH - REFERS TO DIFFERENT APPLICATIONS '691 and '381

In fact, in case number 07/760,970, of which the present case is a divisional application, several methods are specified for removing said heat heat. In S.N. 09/579,381 which is another divisional, taught is a method for integrating three (or more) reactors into a power and product grid with means to extract product, including heat, through the socket, and with means for using electrical and thermal connectors held in a mechanical connecting system, means including clips and sockets, means to allows replacement and coupling to the control system, means using conductive and insulating clips, means to extract the heat from the reactor, means including heat pipes, diamond, or composites of diamond in thermally conductive epoxy filled with diamonds, means including a heat dissipative radiator, and means including separation of the anodes and

anodic connectors from the cathodes and cathodic connectors. Simply put, '381 is an improvement for heat removal and integration of smaller units into larger assemblies. In the preferred embodiment, the apparatus described by the present application is a device shaped like a fuse and can be easily placed into, or removed from, an assembly. The damage or rundown of one unit "is thus easily exchangeable by replacement with a functioning one", which is re-inserted, as taught in the above-entitled application, into mechanical restraining, electrical, and thermal connectors (labelled 94, 96, and 97) and further restrained with clips (labelled 92). The clips that can be used in these devices capable of integrating reactors involving a material loaded with hydrogen are well known to those who work in the art with the exception of the fact that in the present application there is the novel and nonobvious method of having product transfer taken place to the socket itself. '381 involves product transfer through the socket itself. Thus, '381 teaches a method for integrating three (or more) reactors into a power and heat grid with means to extract product, with means for using electrical and thermal connectors held in a mechanical connecting system, means including clips and sockets, means to allow replacement and coupling to the control system, means using conductive and insulating clips, means to extract the heat from the reactor through the socket, means including heat pipes, diamond, or composites of diamond in thermally conductive epoxy filled with diamonds, means including a heat dissipative radiator, and means including separation of the anodes and anodic connectors from the cathodes and cathodic connectors.

SUMMARY OF EXAMINER'S DEVIATIONS FROM THE STANDARDS OF REVIEW

107. Where is the Examiner's response to the fact that Applicant has elected to submit his theories (and experimental work) before peer review in fusion technology run by the American Nuclear Society in hot fusion community since 1992. These, they surmounted peer-review and were published, and cited to the Office to explain the observed cold fusion phenomena, and published with other demonstrations of this field (including Hagelstein 1993A, 94; Takahashi 91, Swartz 1992, 94A, 96B, 97A, 97B; McNally 89; Hora 93; Johnson 94; Mills 94; Mills 95; Li 95; Kim 90, 94A, 94B, 95, 96; Matsumoto 89; Chubb 90, 91, 94A, 94B; Szpak 91; Tajima (90); Schneider 89; Rice 90, Zhu 90, and Bush 91A). Where does the Office offer a single equation, graph, or serious theory to dispute anything in the above entitled original specification and claims? Nowhere.

Where is the Examiner's response to the Optimal Operating Points which the Applicant has taught? Where is the Examiner's response to Figure 2 from Applicant's peer-reviewed publication presented in the last communication to the Examiner? There is none. Instead, ignoring it, the Examiner inaccurately states there is no disclosure.,

However, "optimal operating points" must be understood to successfully use LENR/CF systems. Many "negative" results the result of the failure to operate the system at the optimal operating point. Figure 2 showed the biphasic response of the products (heat, helium-4, tritium) of these systems to increasing input electrical driving power. The horizontal axis represents the electrical input power and is logarithmic. The nickel light water data is from Swartz; the palladium heavy water data are from Miles (USN) and Szpak (USN). The data reveal relatively narrow loci of optimal operating points. Driving with electrical input power beyond the peaks (optimal operating points) does not help the production of the desired product but yields a falloff with increasing input power. Optimal operating points account for some of the widespread difficulties in observing these phenomena because of driving the systems inadvertently or unintentionally outside of the optimal operating point (Swartz. M., Journal New Energy, 4, 2, 218-228 (1999), Swartz. M., Transactions of the American Nuclear Association, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85); Swartz. M., G. Verner, A. Frank, H. Fox, Journal of New Energy, 4, 2, 215-217 (1999); Swartz. M., 1997, Fusion Technology, 31, 63-74). Applicant cites his publications and other applications. In '457 Applicant taught "increasing through a series of at least three incremental steps the electric power drive conditions of said electrical circuit" on page 15, lines 15-20, and page 23, lines 14-17. Furthermore, in '457 and in the corresponding figures in Swartz(97), there are graphs of the output [Figure 6, labels 701, 702] and the V-I (voltage current) characteristics [Figure 5, labels 503, 510, 519, 520, 504, 521].

Where is the Examiner's response to Applicant's description of barriers which are used to strategically inhibit the flow of isotopic fuel. They are not in the cited patents and art? There is none. As taught in the original specification, Applicant has described barriers which are used to strategically inhibit the flow of isotopic fuel (deuterons in palladium by boron, or protons in nickel by gold) (confer Appendix C which is in the file record, and included here again for reference, and the other cited references including the published peer-reviewed publication Swartz, 1998, Improved Electrolytic Reactor Performance Using π -Notch System Operation and Gold Anodes, Transactions of the American Nuclear Association, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85; Swartz, 1997, "Biphasic Behavior in Thermal Electrolytic Generators Using Nickel Cathodes", IECEC 1997 Proceedings, #97009; Swartz, 1998. The breadth of this subject requires an Appendix which was attached hereto and has been part of the file record of the '970. This introduction to the subject delineates many different barriers which can be divided into classes based upon characteristics discussed therein. There are a spectrum of "barriers" in this field. Some are structural, some are diffusive, some enable electrophoresis, some dielectrophoresis and its magnetic equivalent. Many are fully specified in the present inventions's original disclosure, many novel and unobvious from prior art. For example, in the preferred

embodiment of said referred to application of which the present application is a Divisional, the cathode is surrounded in coaxial fashion by a deuterium diffusion barrier (labelled 50 in figure 7) and an expansion barrier (labelled 40). The cathode is axially-fed the deuterons. As taught in the original specification of '970, in the preferred embodiment, this two-stage process is housed in a structural support system (labelled 20).] The full charging is discussed in detail in the referred to peer-reviewed publications including Swartz (92), Swartz (94), Swartz (97A), Swartz (98A), and Swartz (98B).

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108. These peer-reviewed publications, Exhibits and Declarations prove Applicant was correct on the filing date of the application [In re Hogan, 559 F.2d 595, 60S, 194 USPQ 527, 537 (CCPA 1977)]. They prove that the Applicant taught the subject matter defined by each of the rejected Claims including how his apparatus and method works, set forth the best mode contemplated, distinctly pointed out and claimed the subject matter which constitutes the invention, wrote an adequate enabling disclosure, and thus complied and conformed with 35U.S.C. §112, first paragraph, of the Patent Act. This was done so that an artisan, or those skilled in the art, could practice it without undue experimentation [In re Wands, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988), citing with approval Ex parte Forman, 230 USPQ 546, 547 (Bd. Pat. App. & Int. 1986)]. Applicant has now demonstrated that his invention as claimed was, and is, adequately described to one skilled-in-the-art. Said Declarations are sufficient in their factual content with respect to the significant evidence, and prove that the Examiner is in clear error. By submitting said peer-reviewed publications, showing the Applicant is correct, and said Declarations containing relevant facts by probative witnesses, the Applicant has now undertaken the full burden coming forward with his evidence as required [In re Oetiker, 977 F.2d at 1445, 24 USPQ2d at 1444].

Ignored (along with the evidence) yet again in the Examiner's Communication are the following standards of review. These were cited previously and no reason has been given by the Examiner for his deviation from said standards of review.

The Examiner ignores In re Prater, 415 F.2d 1393, 162 USPQ 541 (CCPA 1969)] which requires the Examiner to refer to the claimed invention as the focus of its Office communication, but it did not when drifting toward criticism of "FP".

The Examiner ignores In re Morris which requires that the Examiner must respond to what Applicant meant, but he did not.

The Examiner ignores In re Hogan [559 F.2d 595, 60S, 194 USPQ 527, 537 (CCPA 1977)] which discusses that enablement must be judged on the original specification and claims, but in this Communication it was not.

The Examiner ignores In re Fouche [439 F.2d 1237, 1243, 169 USPQ 429, 434, (CCPA 1971) and In re Zletz [893 F.2d 319, 13 USPQ2d 1320 (Fed. Cir. 1989)] which state that an invention (in structure, operation and composition) is defined by the claims and the original specification.

The Examiner ignores In re Gazave, 54 CCPA 1524, 379 F.2d 973, 154 USPQ 92 (1967) and In re Chilowsky [43 CCPA 775, 229 F.2d 457, 108 USPQ 321 (1956)] which require consideration of the material which Applicant supplied and cited.

The Examiner ignores In re Oetiker, 977 F.2d at 1445, 24 USPQ2d at 1444 which requires the Examiner to substantively respond with a *prima facie* case of unpatentability. However, after the submission of Swartz, 1998, Improved Electrolytic Reactor Performance Using π -Notch System Operation and Gold Anodes, Transactions of the American Nuclear Society, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85 and Swartz(97), other peer-review papers, and the Declarations, the burden shifts back to the Office and can only be discharged by the Examiner "presenting evidence or reasons why persons skilled-in-the-art would not recognize in the disclosure a description of the invention defined by the claims" [Wertheim, 541 F.2d at 263, 191 USPQ at 97]. Applicant asks that this be done with specificity, substantivity, and with explicit reference, and in detail with full findings of fact.

The Examiner ignores In re Brana and In re Eltgroth, 419 F.2d 918, 164 USPQ 221 (CCPA 1970) which demand that the Examiner must establish a reason to doubt an invention's asserted utility, and the loading of an isotopic fuel into a material by an applied electric field, using a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal and means to extract product using magnetic field inhomogeneity, based differential magnetic susceptibilities [cf. Swartz and Straus Declarations] is not 'incredible' or 'unbelievable' like the Examiner appears to purport. This invention is quite believable.

The Examiner ignores In re Vaeck [947 F.2d 488, 495-96, 10 USPQ2d 1438, 1444 (Fed. Cir. 1991)] which states that an enablement rejection under section 112, ¶1 is only appropriate where the written description fails to teach those skilled-in-the-art, like the Declarants, to make and use the invention.

109. The Examiner ignores Rule 132 which requires Applicant's solid, substantial, and timely, evidence submitted against the Examiner's rejections be considered because "(p)atentability is determined on the totality of the record, by a preponderance of the evidence with due consideration to persuasiveness of argument." [Id. at 1445, 24 USPQ2d at 1444]. Applicant has published his inventions, proving that this invention was correctly taught in the original specification and claims, on the filing date of the application.

110. The Examiner has ignored controlling authorities including Clause 8 of Section 8, Article I, by improperly eliminating an entire field involving energy and United States security.

The Examiner has ignored controlling authorities including Article VI, by interfering laws passed by Congress [Diamond v. Chakrabarty; 447 U.S. 303, 309] including that patentable statutory subject matter spans "anything under the sun that is made by man" [S. Rep. No. 1979, 82d Cong., 2d Sess., 5 (1952); H. R. Rep. No. 1923, 82d Cong., 2d Sess., 6 (1952)].

111. The Examiner has ignored controlling authorities including Article I, Section 2, by ignoring that Applicant is entitled to the privileges and immunities of citizens in the other states. Specifically, the Examiner ignores that the Office, Europe and Japan have allowed selected other patents in the very same field not allowed here [Czirr(5,231,290), Westphal(5,215,631), Ahern(5,411,654), Patterson(5,036,031), (5,318,675), (5,372,688), (5,036,031); Aspden, UK-GB 2,231,195B]. This is a dual-tiered system. No such demand was made of these other patents. There appear to be two different standards of review. Therefore, the Examiner has ignored controlling authorities including the reasoning of the Supreme Court in United States v. Nixon (1974) that all are "equal under the law". Hence, the Examiner has ignored controlling authorities including the 14th Amendment, requiring an impartial tribunal [28 U.S. Code Section 144, Mayberry v. Penna., 91 S.8.; Bloom v. Illinois, 88 Ct. 499 S.Ct. 1477; Duncan v. Louisiana, 88 S.Ct.1444] and equal protection. In the light of the previously unrebuted Declarations [hereby again submitted] there appear to be violations of the 14th Amendment's "equal protection" clause [Frontiero v. Richardson, 93 S.Ct. 1736, 411 U.S. 677; Weiss v. Weiss, 436 N.Y.S. 2d. 862, 52 N.Y. 2d. 170 (1981)] with serious implications [Gass v. Lopez, 95 S. Ct 729; Wood v. Strickland, 95 S Ct 9S2: U.S. v. Price, 86 S Ct 1152, 1157, Footnote 7; Griffin v. Breckenridge, 91 S Ct 179D; Gamez v. Toledo, 42 U.S.C. §1983, and Bivens v. Six Unknown Named Agents of Fed. Bureau of Narcotics].

112. In summary, and most importantly, Examiner should have considered, and commented upon substantively, the submitted evidence including:

#1) Declarations from scientists of ordinary skill-in-the-art, who considered the specification and stated that the written description was sufficient. Applicant is acknowledged by those involved in the state-of-the-art (Lin 97, Fox 97, Fox 96A, Rothwell 96). Said evidence shows that the Office's position is in error.

#2) The published peer-reviewed scientific articles [including but not limited to Swartz. M., 1994 "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4. "Proceedings: "Fourth International Conference on Cold Fusion", sponsored by EPRI and the Office of Naval Research, and Swartz, 1998, Improved Electrolytic Reactor Performance Using π -Notch System Operation and Gold Anodes, Transactions of the American Nuclear Society, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85 and Swartz(92, 94A, 97A, 97C)].

By ignoring such evidence consisting of Declarations, and peer-reviewed publications, the Examiner also ignores *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988) which indicates that #1 or #2 are sufficient to demonstrate that the specification provides an adequately written description of the subject matter, including how to operate the invention, and claimed the invention so that an artisan, or those skilled-in-the-art, could practice it without undue experimentation. Either #1 or #2 prove that enablement, utility, and validation. Together, #1 and #2 have been submitted and Applicant submits that these together corroborate enablement of the present invention both *de facto* and *de jure*.

Therefore, in accordance with the foregoing arguments that Applicant has conformed with the requirements of sections 112 of the Patent Act, and reversal of the rejection of Claims 1-10, 12-19, 21, and 22 is respectfully requested, as required by the statute (35 USC 112).

DISCUSSION OF 35 USC 101 REJECTION

113. The Office states,

"Claims 1-10, 12-19, 21, and 22 are rejected under 35 U.S.C. 101 because the claimed invention as disclosed is inoperative and therefore lacks utility".

THE TRUTH - Affiants' Statements are Fact and Support Utility

This was discussed in the previous communication from the applicant to the examiner, dated 12/3/02. The utility of the present invention was discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, on pages 77 through 92. Where is the Examiner's substantive response? The Examiner has ignored many of the Applicant's detailed Arguments.

The Examiner's Response is non-responsive to the submitted Declarations and *Amicus Curiae* Briefs which remain unrebutted and which corroborate both the "utility" of these teachings. In this case, as in S/N 07/760,970 and Federal Appeals Court 00-1108, the Office is disingenuous because the Office has ignored the many Declarants who affirm utility. Said affiants prove utility. It is a fact, apparently ignored and disliked by a hostile element within the US Patent Office which is determined to keep alternative energy from the United States, but it is a fact nonetheless which rebuts the erroneous opinion of the Office.

For example, the Examiner's Response is non-responsive to the Rotegard Declaration:

"If only a few labs had reported success, then skepticism of cold fusion would be viable. Several research teams reported positive finding on the original Fleischmann Pons effect at the Fourth International Conference on Cold Fusion in December 1993. I submit that Occams razor would dictate that the phenomena is real and has been "reproduced" to the point of overkill.

"Major research institutions, industrial corporations and established scientific journals of international repute have endorsed the reality of cold fusion and are acting to explore and benefit from this reality. * These trends would lead a prudent person to conclude that there is substance to the research cited above. Therefore, developments and inventions in this area have great utility."**

[Declaration of Dana R. Rotegard, 1994]

As another example, the Examiner's Response is non-responsive to the fact that Dr. McKubre stated:

"For me, the best heat report, and perhaps the best report at this conference, was that of Mitch Swartz. ... I have not been able to perform the experiments myself, successfully, and I have always felt that the quality of the calorimetric observations in the nickel light water studies has been less than the quality of the calorimetric observations in the palladium-detuerium system. ... Mitch Swartz presented a very clear piece of calorimetric evidence which is certainly going to cause me to reconsider my belief and understanding of the nickel-light water system and its capacity to produce anomalous heat"

[Dr. Michael McKubre, SRI, Infinite Energy, 4, 20 , pp.34-35, (1998)]

As another example, the Examiner's Response is non-responsive to the fact that Dr. Michael Schaffer (A55, 8/7/01) said,

"I do not see how anyone could construe anything that I wrote at Scientific American's site to imply that there is "no utility" in cold fusion, much less in instruments that might be used in cold fusion and other scientific experiments. ... As an expert ... I would agree [Dr. Swartz's invention] ... does have utility".

The Examiner's Response is also non-responsive to the fact that Dr. Rehn, U.S. Navy, said

"Perhaps the clearest scientific fact, at this time, is the hardest for physicists to accept: nuclear reactions apparently do occur in deuterium-loaded Pd, Ti, and probably in other solids."

[Office of Naval Research Asian Office, NAVSO P-3580, Vol. 18, Jan. 1993].

This confirms that Dr. Will, another Office witness, said,

"Significant positive results have been obtained (by) 100 groups from more than 12 countries"

[Final Report NCFI (1991)].

The Examiner's Response is non-responsive to the fact that controlled nuclear fusion offers the possibility of an inexpensive source of energy for the United States and is of great utility. The original specification has explicitly indicated why there is great utility of both the field and the present invention. Energy needs dominate both the economy and welfare of humanity as has been shown historically. Therefore, this technology has great utility to society.

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114. The Examiner's Response is non-responsive to the fact that he is incorrect and substantively contradicted Drs. Chubb, Fox, Mallove, McKubre, and by the Office's own previous witnesses, Dr. Rehn and Dr. Will. This is important because proof of utility should be judged either by those using the invention or those skilled in the art. Corroborating this, validation occurs when scientists actually skilled, and working, in the state-of-the-art state it to be so. These scientists who write the current scientific technical papers which undergo peer-review, file patent applications, and attend international conferences (which have gone on for thirteen years) and they absolutely disagree with the Examiner.

The Examiner's Response is non-responsive to the fact that utility is a fact question, and proof of utility is sufficient if it is convincing to one of ordinary skill in the art or if it meets at least one stated objective. Here it does. Unrebutted Declarations have been

submitted in this case, and are again submitted, and the Examiner must respond to them substantively [Marino v. Hyatt Corporation; Morrill v. Tong; and Chelebda v.H.E. Fortuna & Brothers Inch]. Furthermore, the Examiner has rejected Marino v.Hyatt Corporation, 793 F.2d 427, 430 (1st Cir. 1986); Morrill v.Tong, 390 Mass. 1207 129 (1983); Chelebda v.H.E. Fortuna & Brothers Inch 609 F.2d 1022 (1st Cir. 1979); Lewis v. Bours, 119 Wn.2d 667, 670, 1992] which require the Examiner to assume that the Declarants' assertions are true. The Declarations demonstrate that the original specification and claims clearly define subject matter of considerable utility. Therefore, the Applicant has fully conformed with, and satisfied, the requirements of §101 of the Patent Act and met at least one (1) stated objective [Standard Oil Co. (Indiana) v.Montedison, S.P.A., 664 F.2d 356, 375, 212 USPQ 327, 344 (3rd Cir. 1981), cert. denied, 456 U.S. 915, 102 S.Ct. 1769, 72 L.Ed.2d 174 (1982); E.I. du Pont de Nemours & Co. v.Berkley & Co., 620 F.2d 1247, 1258 n.10, 1260 n.17, 205 USPQ 1, 8 n.10, 10 n.17 (8th Cir.1980); Krantz and Croix v.Olin, 148 USPQ 659, 661-62 (CCPA 1966); Chisum on Patents, 4.04[4] [1983]; RAYTHEON COMPANY v.ROPER CORPORATION, U.S.C.A., Federal Circuit, 1983, 724 F.2d 951, 220 USPQ 592].

115. The Examiner has not followed the standards of review. The Office's own rule [M.P.E.P. §2111.01] requires that "the words of a claim ... must be read as they would be interpreted by those of ordinary skill in the art". In this case, given the averments of so many, utility under USC 101 is clearly shown.

"Utility is a fact question, see e.g., Wilden Pump v. Pressed & Welded Products Co, 655 F.2d 984, 988, 213 USPQ 282, 285 (9th Cir. 1981); Nickola v. Peterson, 580 F.2d 898, 911, 198 USPQ 385, 399 (6th Cir. 1978), cert. denied, 440 U.S. 961, 99 S.Ct. 1504, 59 L.Ed.2d 774 (1979)." [RAYTHEON COMPANY v. ROPER CORPORATION, U.S.C.A., Federal Circuit, 1983, 724 F.2d 951, 220 USPQ 592]]

"When a properly claimed invention meets at least one stated objective, utility under 101 is clearly shown. See e.g., Standard Oil Co. (Indiana) v. Montedison, S.P.A., 664 F.2d 356, 375, 212 USPQ 327, 344 (3rd Cir. 1981), cert. denied, 456 U.S. 915, 102 S.Ct. 1769, 72 L.Ed.2d 174 (1982); E.I. du Pont de Nemours & Co. v. Berkley & Co., 620 F.2d 1247, 1258 n. 10, 1260 n. 17, 205 USPQ 1, 8 n. 10, 10 n. 17 (8th Cir.1980); Krantz and Croix v. Olin, 148 USPQ 659, 661-62 (CCPA 1966); Chisum on Patents, 4.04[4] [1983]." [RAYTHEON COMPANY v. ROPER CORPORATION, U.S.C.A., Federal Circuit, 1983, 724 F.2d 951, 220 USPQ 592]]

"Proof of utility is sufficient if it is convincing to one of ordinary skill in the art. In re Irons, 52 CCPA 938, 340 F.2d 974, 144 USPQ 351 (1965). The amount of evidence required depends on the facts of each individual case. In re Gazave, 54 CCPA 1524, 379 F.2d 973, 154 USPQ 92 (1967). The character and amount of evidence needed may vary, depending on whether the alleged utility appears to accord with or to contravene established scientific principles and beliefs. In re Chilowsky, 43 CCPA 775, 229 F.2d 457, 108 USPQ 321 (1956)."

[In Re Jolles, U.S.C.P.A., 1980. 628 F.2d 1322, 206 USPQ 885]

The Examiner Mistakes a Question of Fact for a Question of Law

116. The Examiner's Response is non-responsive to the fact that the Examiner dismisses the affiants discussing Applicant's inventions as opinion. However, Declarants' statements and the peer-reviewed publications are Fact. The Examiner has mistaken a question of fact for a question of law. The Examiner cannot dismiss Declarations improperly to "opinion"-status without an adequate explanation of how the Declarations failed to overcome the *prima facie* case initially established by the Examiner. The Examiner has rejected *In re Alton* which requires that even the use of the words "it is my opinion" to preface what someone of ordinary skill in the art knows does not transform the factual statements contained in the declaration into opinion testimony. Exactly how many Declarants does it take to overcome the Examiner's unsubstantiated rejection?

117. The Examiner's Response is non-responsive to the fact that the Examiner has ignored the directive of 1.131 (a)(1) which requires that

"When ... a patent ... is rejected on reference ... to a printed publication, the inventor of the subject matter of the rejected claim ... may submit an appropriate oath or declaration to overcome the patent or publication."

The Examiner's Response is non-responsive to the fact that the Examiner has changed the standards of review.

The Examiner has rejected *In re Zurko* [142 F.3d 1447, 1449, 46 USPQ2d 1691, 1693 (Fed. Cir.), cert. granted, 119 S. Ct. 401 (1998)] which declares that utility is a fact question [Raytheon Company V. Roper Corporation, U.S.C.A., Federal Circuit, 1983, 724 F.2d 951, 220 USPQ 592], and one which the Examiner in this case must review for clear error [*Cross v. Iizuka*, 753 F.2d 1040, 1044 n.7, 224 USPQ 739, 742 n.7 (Fed. Cir. 1985); also *In re Zurko*].

In re Irons indicates that utility is a fact question [Raytheon Company V. Roper Corporation]. The submitted Declarations and the publications (including e.g. McKubre) are relevant as proof of utility. They demonstrate utility and operability at the time of the filing of this patent, and that it was, and is, important and of considerable utility.

The Examiner has rejected *In re Ziegler* [992 F.2d 1197, 1200, 26 USPQ2d 1600, 1603 (Fed. Cir. 1993)] which requires the Examiner accept Declarations as factual proof of utility.

The Examiner has rejected *In re Ferens* [417 F.2d 1072, 1074, 163 USPQ 609,611 (CCPA 1969)] which heralds that Applicant's submitted evidence, including Declarations, is sufficient.

The Examiner has rejected *Ex parte Porter* which requires that Declarations, submitted in response to the Examiner's comments, must be read, examined, and carefully considered.

The Examiner has rejected *In re Morris* [127 F.3d 1048, 1053-56, 44 USPQ2d 1023, 1027-30 (Fed. Cir. 1997)] which demands that the interpretation of operability and utility is predicated upon that which one who is skilled-in-the-art would reach. The Examiner must give the claims their broadest reasonable interpretation consistent with that which those skilled-in-the-art would reach.

The Examiner has rejected *In re Oetiker* [977 F.2d at 1445, 24 USPQ2d at 1444] which requires the Examiner substantively and fully respond to the probative witnesses, because Applicant has undertaken the full burden coming forward.

The Examiner has rejected *Ex parte Gray* [10 USPQ2d 1922, 1928 (Bd. Pat. App. & Inter. 1989)] which allows for Applicant's submitted expert testimony regarding operability and utility, beyond the detailed specification. The Examiner must give substantial weight to said Declarations about what they said about this invention compared to the Examiner's art regarding the work of others.

The Examiner has rejected *In re Brana*, 51 F.3d at 1566, 34 USPQ2d at 1441] which indicates Applicant's actions hereby meet the "burden shift ... to provide rebuttal evidence sufficient to convince such a person of the invention's asserted utility".

The Examiner has rejected *In re Marzocchi* and *In re Oetiker* which require responsive argument to the fully addressed criticism against the Examiner's unfounded notions. *In re Marzocchi*, 439 F.2d 220, 223, 169 USPQ 367, 369 (CCPA 1971)] declares that the Examiner cannot make the rejection he has unless he has reason to doubt the objective truth of the statements contained in the written description, here corroborated and supported by multiple Declarations.

ADDITIONAL REASON OVERCOMING THE EXAMINER'S POSITION REGARDING USC 101

Transformation for Inactive to Active is Patentable even without the Other Features

118. Utility is a fact question, and proof of utility is sufficient if it meets at least one stated objective. Here it does - a method to increase loading.

Furthermore, a method to increase loading necessarily involves transformation of a state or thing. Therefore, the Examiner has not followed the standards of review because such a two state method should be patentable based upon opinion of the Court.

"Transformation and reduction of an article "to a different state or thing" is the clue to the patentability of a process claim that does not include particular machines."

[GOTTSCHALK v. BENSON, 409 U.S. 63 (1972),
409 U.S. 63, No. 71-485]

"Industrial processes such as this ["a physical and chemical process (which involves) the transformation of an article into a different state or thing"] are the types which have historically been eligible to receive the protection of our patent laws. [450 U.S. 175, 185]"

[DIAMOND v. DIEHR, 450 U.S. 175 (1981)]

ADDITIONAL REASON OVERCOMING THE EXAMINER'S POSITION REGARDING USC 101

The Examiner Ignores Constitutional and Congressional Directive and Authority

119. The Examiner has rejected the controlling authority of Art. I, §8, cl. 8 which provides that

"Congress shall have Power (t)o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."

Art. I, §8, cl. 8 empowers Congress in this matter.

The Examiner has rejected that the US Congress has mandated progress.

"The patent laws (reflect) this Nation's deep-seated need to encourage progress."

[DIAMOND v. CHAKRABARTY, 447 U.S. 303 (1980),
447 U.S. 303, No. 79-136]

The Examiner has rejected that the US Congress has mandated encouragement of science, and the Office's actions are inconsistent with the Patent Act of 1793, authored by Thomas Jefferson, which defined statutory subject matter as "any new and useful art, machine, manufacture, or composition of matter" Act of Feb. 21, 1793, 1, 1 Stat. 319, and with the Act which embodied Jefferson's philosophy that "ingenuity should receive a liberal encouragement." [447 U.S. 303, 309].

Given the facts stated above, and the fact the Office has granted patents to inventions of considerably less "utility" [e.g. Patent 3,580,592 or 3,450,403], any further rejection of the present invention on this arbitrary basis based upon such a presumed "non-utility" would appear to be both capricious, unwarranted, and unreasonable. As the original specification and claims teach, the invention solves the long-standing problem of controlling the production of heat or nuclear product and extracting product using magnetic field inhomogeneity, based differential magnetic susceptibilities. - features of great utility. The Examiner should admit that said features are not "incredible" but can be elicited when using the teachings of the original specification and claims. Furthermore, there is documented existence of these reactions and the preferred environment in which the present invention does operate. The number of papers in this field confirms both the "existence" and "utility" of these phenomena and any associated technologies.

120. In summary, the invention (structure, operation and composition) is defined by the claims and the original specification, and in this case they correctly define the invention, and if the teachings have been corroborated, and therefore there is enablement (a question of law; *In re Fouche*, 439 F.2d 1237, 1243, 169 USPQ 429, 434, (CCPA 1971)). Enablement, utility, and operability are grounds for patentability. In this case, the Applicant has set forth products and methods which have undergone peer-review, and Declarants and other affiants who have stated as fact that there is utility within the meaning of 35 U.S.C. 101 [*Brenner v. Manson*, 148 U.S.P.Q. 689].

Therefore, in this case, utility under 101 is clearly shown. Given the utility, Applicant respectfully requests reconsideration and reversal of the rejection of Claims 1-10, 12-19, 21, and 22 pursuant to U.S.C. 101.

CONCLUSION

121. Applicant taught in the original specification and claims how his apparatus works and claimed the invention. Applicant thereafter has made a diligent effort to amend the claims of this application so that Claims 1-10, 12-19, 21, and 22 define a novel structure which is also submitted to render said claimed structure unobvious because it produces new and unexpected results.

Applicant has herein demonstrated that any combination of Westfall or Kinsella or Patterson and/or the other cited art is an improper one, absent any showing in the references themselves that they can or should be so combined, and that neither of the references appears to suggest, or allude to, or teach a structure as defined by the teachings of the original specification of the above-entitled application or claimed by Claims 1-10, 12-19, 21, and 22. Applicant has explained in detail (*supra*) how the other cited art are different and therefore produce a different result from the present invention. The figures and claims of Westfall or Kinsella or Patterson and the other cited art are intended to, and do, serve a different purpose than does the structure defined by the claims, and each of the cited art adds nothing of substance. None of the cited references shows a two-stage process involving loading of hydrogen into a metal electrode such as palladium, including a first stage of electrode loading, followed by, a second stage of sudden rapid ('catastrophic') flow of the loaded hydrogen within the metal and means to extract product using magnetic field inhomogeneity, based differential magnetic susceptibilities -- as the Examiner inaccurately purports.

122. Applicant has given lists of additional critical features and components which distinguish Applicant's invention to operatively function in a different manner compared to said cited art. The Office should issue the patent because Applicant has met --and exceeded-- the requirements specified by the standards of review. The Office should issue the patent because the Applicant has supported his work with both peer-reviewed publications and Declarations.

The Office should issue the patent because it has been disingenuous. For example, in the Office's latest Communications it purports that Japan has stopped all cold fusion research, but Applicant has demonstrated Japanese cold fusion efforts did preceed World War II (*supra*) and do continue and accelerate to this day, and in several Japanese laboratories and companies including Mitsubishi (*supra*). The Office was incorrect and that is important because Japan gives patents on cold fusion because technologies are important to Japanese security and consistent with the Japanese Constitution. Fewer patents are issued in Japan (Exhibit "D", attached), but Japan issues patents on cold fusion.

The Office should issue the patent because the US Patent Office has ignored the US Constitution and US security and US citizens' civil rights by withholding reasonable cold fusion patents even though "(m)ost patent applications submitted to the U.S. Patent and Trademark Office are approved" (Exhibit "D"). And they are, including astrology patents to predict lottery numbers. The mathematics of the Office's systematic discrimination and warfare upon the inventive American citizenry for fourteen years speaks indelibly for itself. The Office is in breach of its responsibility, and the aegis of authority granted to it by Congress under the United States Constitution.

Request For Constructive Assistance

123. Applicant's previous request for constructive assistance was made and discussed in the previous communication from the Applicant to the Examiner, dated 12/3/02, on page 94. Applicant thanks the Examiner for the suggestions made, and states: If, for any reason the claims of this application are not believed to be in full condition for allowance, the applicant respectfully requests the constructive assistance and suggestions of the Examiner in drafting one or more acceptable claims [pursuant to MPEP 707.07(j)] or in making constructive suggestions [pursuant to MPEP 706.03(d)] in order that this application can be placed in allowable condition as soon as possible and without the need for further proceedings.

Applicant notes that the U.S. Supreme Court has ruled that any *pro se* litigant is entitled to less stringent standards [U.S. Rep volume 404, pages 520-521 (72)].

124. Based upon the facts cited here, and the submitted Declarations and the peer-reviewed published papers proving validation both *de jure* and *de facto*, these Claims 1-10, 12-19, 21, and 22 are patentable over the cited references because the claims recite novel structure and thus are distinguished physically over every reference [Sec. 102], with physical distinctions which effect new and unexpected results, thereby indicating that the physical distinction is simply not obvious [Sec. 103].

If this application is not allowed, and the Examiner continues to disagree with the numerous Affiants and peer-reviewed published papers, then the Applicant hereby formally requests explicitly that the Examiner respond in full with specificity as to the reason to facilitate Appeal, with the Examiner making clear on the record with precision which of these submitted averments by each Declarant regarding operability and utility were formally considered, and if the Examiner disputes them, exactly how he reached his conclusion, and why by substantive and adequate explanation how the Declarations failed to overcome the *prima facie* case initially established by the Examiner.

WHEREFORE for the above reasons, including submitted Declarations and the peer-reviewed published papers proving validation both de jure and de facto, the Applicant respectfully requests reconsideration and reversal of Claims 1-10, 12-19, 21 and 22 are rejected under 35 U. S. C.102(b) as being anticipated by Westfall (US 5,215,631), Claims 1, 2, 4, 5, 7, 10, 13, 15, 16 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Kinsella et al.(US 3,682,806), Claims 1-8 and 13-16 are rejected under 35 U.S.C.102(b) as being anticipated by Patterson (US 5,318,675) or Patterson (US 5,372,688), and all Claims 1-10, 12-19, 21, and 22 rejected under 35 U.S.C. 112 and 35 U.S.C. 101 by the Examiner, based upon flawed reference to other art ("FP" or "F+P") rather than the present invention, as is just and reasonable.

Very respectfully submitted,



Mitchell R. Swartz, ScD, MD, EE
Weston, MA

Certificate Of Mailing [37 CFR 1.8(a)]

May 5, 2003

To Whom it Does Concern:

I hereby certify that this correspondence will be deposited with the United States Postal Service by First Class Mail, postage prepaid, in an envelope addressed to

"Commissioner for Patents
P.O.Box 1450, Alexandria, VA 22313-1450"
on the date below. Thank you.

Sincerely,



May 5, 2003

M.R. Swartz

**VERSION WITH MARKINGS TO SHOW CHANGES MADE
IN THE SPECIFICATION**

In The Claims ['765]

Claim 5 has been amended as follows:

5. (Amended) . A method as in claim 4 wherein said loaded material is a member of the group consisting of palladium, Groups IVb, Vb, and rare earth elements.

VERSION WITH MARKINGS TO SHOW CHANGES MADE**In The Specification**

U.S. PATENT DOCUMENTS on page 3 have been amended as follows:

U.S. PATENT DOCUMENTS

Serial number Filing Date

07/339,976 04/18/1989 Swartz, M.

07/371,937 06/27/1989 Swartz, M.

08/406,457 03/20/1995 Swartz, M.

09/573,381 05/19/2000 Swartz, M.

*not in patent applied
not in orig
} delete*

Paragraph 4, page 3, [changes lines 17-25] has been amended as follows:

[Amended] The present invention relates to electrochemical reactions in or about metals, such as palladium which has been electrochemically loaded with deuterium, but it has relevance as well, to hydrogen loading storage, fuel cells, nuclear fusion, and other reactions in pressure-loaded metals such as titanium or palladium filled with deuterium, and to the broader field of metallurgy and engineering in or about metals, including Groups IVb, Vb, and some rare earths.

[Corrected] The present invention relates to electrochemical reactions in or about metals, such as palladium which has been electrochemically loaded with deuterium, but it has relevance as well, to hydrogen loading, nuclear fusion, and other reactions in loaded metals such as titanium or palladium filled with deuterium, and to the broader field of metallurgy and engineering in or about metals, including Groups IVb, Vb, and some rare earths.

OTHER PUBLICATIONS listed on page 4 has been amended as follows:

J. O'M Bockris, K.N. Reddy, "Modern Electrochemistry", Plenum Press (1970).
C. A. Hampel, Rare Metals Handbook, Reinhold Publishing Corp, (1954).
M. Hansen, Constitution of Binary Alloys, McGraw-Hill Book Co., Inc. (1958).
J. R. Melcher, "Continuum Electromechanics", MIT Press, Cambridge, (1981).
C. J. Smithells, Metals Reference Book, Butterworths Scientific, (1949).
H. H. Uhlig, Corrosion and Corrosion Control, John Wiley & Sons, Inc., (1971).
M. Swartz, "Quasi-One-Dimensional Model of Electrochemical Loading of Isotopic Fuel into a Metal", *Fusion Technology*, 22, 2, 296-300 (1992).
M. Swartz, (1994A) "Isotopic Fuel Loading Coupled To Reactions At An Electrode", *Fusion Technology*, 26, 4T, 74-77.
M. Swartz, (1994B) "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4. "Proceedings: "Fourth International Conference on Cold Fusion", EPRI and Office of Naval Research.
M. Swartz, "A Method To Improve Algorithms Used To Detect Steady State Excess Enthalpy", *Transactions of Fusion Technology*, 26, 156-159 (1996).
M. Swartz, "Consistency of the Biphasic Nature of Excess Enthalpy in Solid State Anomalous Phenomena with the Quasi-1-Dimensional Model of Isotope Loading into a Material", *Fusion Technology*, 31, 63-74 (1997A).
M. Swartz, "Hydrogen Redistribution By Catastrophic Desorption In Select Transition Metals", *Journal of New Energy*, 1, 4, 26-33 (1997B).
M. Swartz, "Codeposition Of Palladium And Deuterium", *Fusion Technology*, 32, 126-130, (1997C).
M. Swartz, Improved Electrolytic Reactor Performance Using π -Notch System Operation and Gold Anodes, *Transactions of the American Nuclear Association*, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85 (1998A).
M. Swartz, "Patterns of Failure in Cold Fusion Experiments, Proceedings of the 33RD Intersociety Engineering Conference on Energy Conversion, IECEC-98-I229, Colorado Springs, CO, (1998B).
A. Von Hippel, "Dielectric Materials and Applications", MIT Press, (1954)
A. Von Hippel, D.B. Knoll, W.B. Westphal, "Transfer Of Protons Through 'Pure' Ice Ih Single Crystals", *J. Chem. Phys.*, 54, 134, (also 145), (1971).

Paragraph 1 on page 10 [change in line 22] has been amended as follows:

Figure 1 symbolically shows the compartments used to analyze an electrochemical reactor. Figure 1 gives organization to the different parts of a simple reactor referred to in this disclosure. It is not meant to be physically realistic with respect to size. The cathode is dissected into four regions. Three compartments are shown within the metal itself. The flow of deuterons is shown by arrows. The label 1 represents the metallic cathode, usually palladium in the preferred configuration. The labels 2 and 3 represents compartments 2, and 3 respectively, which are discussed in detail below. The label 7 represents the anode which in the preferred embodiment is composed of palladium. The label 6 represents the solution consisting in the preferred embodiment of a gel containing antidesiccant, in combination with LiOD, palladium salts, and heavy water (D_2O). The power supply and control unit consists of a current source and ~~FUSOR reactor control device~~ as described in Swartz (1989), and are not shown in the figure. For simplicity, the electrical connections, heat removing apparatus, and several improvements described in this disclosure are not shown in figure 1.

Paragraph 1 on page 11 [addition to line 6] has been amended as follows:

Classically, an electrode in a deuteron solution at equilibrium should measure potentials associated with the Nernst equation. However, during the reaction, the system is not at equilibrium. Thermodynamics assumes equilibrium but tells nothing of the rate. Therefore, a quasi-1-dimensional model can be used to describe the situation external to the cathode [Swartz, M., 1992, "Quasi-One-Dimensional Model of Electrochemical Loading of Isotopic Fuel into a Metal", *Fusion Technology*, 22, 2, 296-300; Swartz, M., 1994A, "Isotopic Fuel Loading Coupled To Reactions At An Electrode", *Fusion Technology*, 26, 4T, 74-77; Swartz, M., 1997C, "Codeposition Of Palladium And Deuterium", *Fusion Technology*, 32, 126-130 (1997)]. In the absence of solution convection, molecular flux (F) results from both concentration gradients and electrophoretic drift.

[Corrected] Classically, an electrode in a deuteron solution at equilibrium should measure potentials associated with the Nernst equation. However, during the reaction, the system is not at equilibrium. Therefore, a quasi-1-dimensional model can be used to describe the situation external to the cathode [Swartz, M., 1992, "Quasi-One-Dimensional Model of Electrochemical Loading of Isotopic Fuel into a Metal", *Fusion Technology*, 22, 2, 296-300; Swartz, M., 1994A, "Isotopic Fuel

· Loading Coupled To Reactions At An Electrode", Fusion Technology, 26, 4T, 74-77; Swartz, M., 1997C, "Codeposition Of Palladium And Deuterium", Fusion Technology, 32, 126-130 (1997)].

Paragraph 2 on page 11 [addition on line 15] has been amended as follows:

Coupled equations thus determine the distribution of deuteron species in the bulk solution. K_f is the bulk rate of the desired reactions. K_c is the rate at which deuterons physically enter the palladium cathode. B is the diffusivity of the isotopic fuel loaded into the material. I, A and F are the electrical current, area, and the Faraday. $[D^+]$ is spatially and time variant.

Paragraph 2 on page 13 [addition to line 26] has been amended as follows:

This occurs until, by a second catastrophic process, the fusion-defect-site is no longer confined [Swartz, M., 1994B, "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4. "Proceedings: "Fourth International Conference on Cold Fusion", EPRI and Office of Naval Research; Swartz, M., 1997B, "Hydrogen Redistribution By Catastrophic Desorption In Select Transition Metals", Journal of New Energy, 1, 4, 26-33]. The final reactions in the CAM theory ends with the opening up of the defect or fissure through a large crack (compartment 3). By this theory the fissures are the result of the catastrophic desaturation of the active medium that was previously fully deuterated (e.g. in the preferred embodiment palladium or titanium).

[Corrected] This occurs until, by a second catastrophic process, the fusion-defect-site is no longer confined [Swartz, M., 1994B, "Catastrophic Active Medium Hypothesis of Cold Fusion", Vol. 4. "Proceedings: "Fourth International Conference on Cold Fusion", EPRI and Office of Naval Research; Swartz, M., 1997B, "Hydrogen Redistribution By Catastrophic Desorption In Select Transition Metals", Journal of New Energy, 1, 4, 26-33]. The final reactions in the CAM theory ends with the opening up of the defect or fissure through a large crack (compartment 3). By this theory the fissures are the result of the catastrophic desaturation of the active medium that was previously fully deuterated (e.g. in the preferred embodiment palladium or titanium).

The last paragraph on Page 19 (continuing as first paragraph on Page 20; changes on page 20 lines 9-11) has been amended as follows:

The reactions of deuterium continue until the crystalline palladium (the active medium because of its high fractional saturation and its exothermic desaturation tendency) is spent of its deuterons or until, by a second catastrophic process, the fusion-defect-site is no longer confined. At that point, catastrophic exposure of compartment 2 to the ambient occurs creating compartment 3. The intracathodic compartment 3 of the CAM theory is known from endstage deuteron (or hydrogen) embrittlement. This compartment usually declares itself when the dissolved deuterons, after entering a metal through a corrosion reaction or by cathodic polarization, explode into the ambient as the metal fissures or otherwise irrefutably changes shape. The calculated fugacities involved are enormous ranging from 5000 up to an estimated 10^7 atmospheres for hydrogenated palladium [Bockris].

The second paragraph on Page 19 [additions to line 12-16] has been amended as follows:

This type of system, coupled with the FUSOR (JET Energy Technology, Wellesley Hills Weston, MA) drive system or its equivalent [Application '976; Swartz, M., 1997A, "Consistency of the Biphasic Nature of Excess Enthalpy in Solid State Anomalous Phenomena with the Quasi-1-Dimensional Model of Isotope Loading into a Material", *Fusion Technology*, 31, 63-74; Swartz, M., 1998A, Improved Electrolytic Reactor Performance Using π -Notch System Operation and Gold Anodes, *Transactions of the American Nuclear Association*, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85], is capable of filling the cathode with deuterium from the solution. However, the deuterated metals could also be filled by codeposition of deuterium and palladium, or by high pressure deuterium gas.

[Corrected] This type of system, coupled with the FUSOR (JET Energy Technology, Wellesley Hills, MA) drive system or its equivalent [Application '976; Swartz, M., 1997A, "Consistency of the Biphasic Nature of Excess Enthalpy in Solid State Anomalous Phenomena with the Quasi-1-Dimensional Model of Isotope Loading into a Material", *Fusion Technology*, 31, 63-74; Swartz, M., 1998A, Improved Electrolytic Reactor Performance Using π -Notch System Operation and Gold Anodes, *Transactions of the American Nuclear Association*, Nashville, Tenn 1998 Meeting, (ISSN:0003-018X publisher LaGrange, Ill) 78, 84-85], is capable of filling the cathode with deuterium from the solution. However, the deuterated metals could also be filled by codeposition of deuterium and palladium, or by high pressure deuterium gas.

In The Claims

Claim 1 has been amended as follows:

1. In a process for producing a product using a material which is electrochemically loaded with an isotopic fuel, a method of controlling the loading which includes in combination:

~~supplying said isotopic fuel into said material,~~

~~providing means for loading said isotopic fuel into said material to saturate said material,~~

~~then providing means for producing a change in the active quantity of said isotopic fuel within said material,~~ *do not follow*

creating thereby a catastrophic diffusion flux of said isotopic fuel within said material,

→ providing a diffusion barrier to said diffusion flux of said isotopic fuel within said material,

means thereby producing said product.

1.(Corrected) In a process for producing a product using a material which is electrochemically loaded with an isotopic fuel, a method of controlling the loading which includes in combination:

loading said isotopic fuel into said material,

then providing means for producing a change in the quantity of said isotopic fuel within said material,

creating thereby a catastrophic diffusion flux of said isotopic fuel within said material,

providing a diffusion barrier to said diffusion flux of said isotopic fuel within said material,

means thereby producing said product.

Claim 3 has been amended as follows:

3. (Amended) A method as in claim 1 wherein said ~~second material loaded isotopic fuel~~ is a member of the group consisting of deuterium or deuterons.

3. (Corrected) A method as in claim 1 wherein said loaded isotopic fuel is a member of the group consisting of deuterium or deuterons.

Claim 4 has been amended as follows:

4. (Amended) In a process using an isotopic fuel loaded into a material, a two-stage method for controlling the loading which includes in combination:

~~supplying said isotopic fuel into said material,~~

~~providing means for loading said isotopic fuel into said material to saturate said material,~~

then providing means for producing a change in the ~~active~~ quantity of said isotopic fuel within said material,

creating thereby a catastrophic diffusion flux of said isotopic fuel within said material.

4. (Corrected) In a process using an isotopic fuel loaded into a material, a two-stage method for controlling the loading which includes in combination:

loading said isotopic fuel into said material,

then providing means for producing a change in the quantity of said isotopic fuel within said material,

creating thereby a catastrophic diffusion flux of said isotopic fuel within said material.

Claim 6 has been amended as follows:

6. (Amended) A method as in claim 4 wherein ~~second material loaded isotopic fuel~~ is a member of the group consisting of deuterium or deuterons.

6. (Corrected) A method as in claim 4 wherein loaded isotopic fuel is a member of the group consisting of deuterium or deuterons.

Claim 8 has been amended as follows:

8. (Amended) A method as in claim 4, where the said means to produce a change in the ~~active~~ quantity of said isotopic fuel within said material is by a change in temperature of said material.

Claim 12 has been amended as follows:

12. (Amended) A method as in claim 10 wherein said means of removing said product utilizes an applied spatially inhomogeneous magnetic field.

12. (Corrected) A method as in claim 10 wherein said means of removing said product utilizes an applied spatially inhomogeneous magnetic field.

Claim 13 has been amended as follows:

13. (Amended) An apparatus to produce a product using a material loaded with an isotopic fuel, which includes in combination:

- means to supply said isotopic fuel to said material,
- means to load said isotopic fuel into said material to saturate said material,
- means to produce a change in the active quantity of said isotopic fuel within said material,
- means thereby to produce a catastrophic diffusion flux of said isotopic fuel within said material,
- means thereby to produce said product.

13. (Corrected) An apparatus to produce a product using a material loaded with an isotopic fuel, which includes in combination:

- means to load said isotopic fuel into said material,
- means to produce a change in the quantity of said isotopic fuel within said material,
- means to produce a catastrophic diffusion flux of said isotopic fuel within said material,
- means thereby to produce said product.

Claim 19 has been amended as follows:

19. (Amended) An apparatus as in claim 13 wherein the means produce a change in the active quantity of said isotopic fuel within said material is by a change in temperature.

19. (Corrected) An apparatus as in claim 13 wherein the means produce a change in the quantity of said isotopic fuel within said material is by a change in temperature.

Claims 21 and 22 have been added as follows:

21. A method as in claim 1, where the additional step is taken of removing said product produced.

22. A method as in claim 21 wherein said means of removing said product utilizes an applied spatially inhomogeneous magnetic field.